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**RELATIONSHIPS AMONG HEALTH CARE BELIEFS, KNOWLEDGE AND
COMPLIANCE IN CLIENTS WITH TYPE I AND TYPE II ADULT ONSET
DIABETES MELLITUS**

The University of Arizona

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RELATIONSHIPS AMONG HEALTH CARE BELIEFS, KNOWLEDGE
AND COMPLIANCE IN CLIENTS WITH TYPE I AND TYPE II
ADULT ONSET DIABETES MELLITUS

by

Christine Elizabeth Yelton

A Thesis Submitted to the Faculty of the
COLLEGE OF NURSING
In Partial Fulfillment of the Requirements
For the Degree of
MASTER OF SCIENCE
In the Graduate College
THE UNIVERSITY OF ARIZONA

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STATEMENT BY AUTHOR

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December 6, 1985
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ABSTRACT

The purpose of this study was to examine the relationships among health care beliefs, knowledge and compliance in 34 subjects with type I or type II adult onset diabetes mellitus. Data were collected by instruments designed by the investigator and included a Demographic Data Sheet, Value Questionnaire, Responsibility Questionnaire, Knowledge Questionnaire and Compliance Questionnaire. The Value and Responsibility Questionnaires were designed to gather information about health care beliefs. The Knowledge Questionnaire was designed to ascertain correct information, incorrect information and the lack of information. The Compliance Questionnaire was designed to ascertain the frequency of disease-related behaviors. The study revealed a significant correlation between one's values and sense of responsibility, a higher level of knowledge in Group II and a higher incidence of compliance in Group I. The findings suggest that nursing personnel need to reinforce disease-related patient education and compliance requirements on a systematic basis.

CHAPTER 1

INTRODUCTION

Diabetes mellitus is a multifaceted, chronic metabolic disease requiring lifelong treatment and adherence to an individually prescribed medical regimen. Without strict cooperation from the client with the disease, severe, life-threatening complications can occur. The client's appreciation of and participation in his medical regimen are influenced by his health care beliefs and his level of knowledge about his disease. In order to effectively interact with clients with diabetes mellitus, health care professionals need to be aware of preestablished health care beliefs and disease knowledge to maximize the client's global understanding and encourage compliance.

This study was concerned with compliance to a planned and prescribed regimen for the treatment and management of diabetes mellitus. The impact one's health care beliefs and level of knowledge have on compliance was also addressed.

Statement of the Problem

What are the relationships among health care beliefs, acquired knowledge and practiced compliance in clients with type I and type II adult onset diabetes mellitus? Are there differences among health care

beliefs, acquired knowledge and practiced compliance in type I and type II clients with diabetes mellitus?

Statement of the Purpose

The purpose of this study was to examine the relationships among health care beliefs, knowledge and compliance. This study also examined health care beliefs and knowledge as related to compliance in clients with type I and type II adult onset diabetes mellitus.

Significance of the Problem

Diabetes mellitus is the third major cause of death in the United States. According to the American Diabetes Association (1984) there are approximately 12,000,000 known or suspected persons with diabetes mellitus. Of this total 12,000,000, there are 5,000,000 persons who have diabetes mellitus but remain unaware and undiagnosed. Each year 300,000 persons in the United States die from diabetes mellitus. Another 600,000 persons are diagnosed yearly with diabetes mellitus (American Diabetes Association 1984). Besides being the third leading cause of death in the United States, diabetes mellitus causes and accelerates severe medical complications including neuropathy, vascular deterioration, retinopathy, heart disease, cerebral vascular accidents, blindness, kidney disease and skin breakdown with subsequent impaired healing (Parks 1978).

Epidemiological information attests that a substantial percentage of morbidity and mortality from diabetes mellitus is preventable through disease management (Paulozzi et al. 1984). Tunbridge (1981), in a study with a British population less than 50 years old, found that 15 percent of those who expired with diagnosed diabetes mellitus died of preventable

complications. A study conducted in the state of Washington through the Diabetes Demonstration Control Project of 1979, analyzed diabetes mellitus related deaths from 1968-1979. This study concluded that: 1) persons with diabetes mellitus under 45 years of age risk an eight times greater mortality rate from medical causes and 2) almost one-third of the diabetic related mortality rate occurred due to medical complications for which there exists prescribed treatment (Connell et al. 1983). Research in a Rhode Island study consisting of 275 insulin-dependent persons with diabetes mellitus under 30 years of age found that greater than one-half of the 275 hospitalizations were directly attributable to infection and poor diet control (Fishbien et al. 1982).

According to the American Diabetes Association (1984) over 2,000,000 hospitalizations each year are attributed to diabetes mellitus with the total economic cost approaching \$10,000,000,000 annually. A significant portion of the economic expenditures is attributed to treatment of secondary complications including disability. Those with diabetes mellitus have a 15 times greater chance for blindness, 17 times greater chance for kidney disease, five times greater chance for gangrene and a two times greater chance for heart disease (American Diabetes Association 1984).

The American Diabetes Association (1984) has cited the susceptible population as fitting into one or more of the following categories:

1. Overweight
2. Over 40 years of age
3. Women, 50 percent more likely than men

4. Non-Whites, 20 percent more likely than Whites
5. Those earning less than \$5,000 annually, 300 percent more likely than middle-income and wealthy

Conceptual Framework

The conceptual framework for this study was adapted from Hochbaum's Health Belief Model, as described by Devon and Powers (1984), and included review of the literature concerning health care beliefs, knowledge and compliance: Figure 1 represents the conceptual framework for this study with two conceptual levels and an empirical level. The more abstract level demonstrates conceptual relationships among health care beliefs, knowledge and compliance. At the less abstract level are the conceptual relationships among values, responsibility, perceived need for knowledge and outcome behaviors. At the empirical level, values and responsibility were measured by value and responsibility scales respectively. Perceived knowledge needs were measured by a diabetes mellitus knowledge level questionnaire. Outcome behaviors were measured by a compliance questionnaire indicating the frequency of compliance.

Definitions

Health Care Beliefs - attitudes about health values, needs and responsibilities.

Knowledge - a mental collation of facts to guide actions.

Compliance - behaviors performed at the suggestion of health care providers in direct response to disease management.

Type I Adult Onset Diabetes Mellitus - insulin dependent.

Type II Adult Onset Diabetes Mellitus - insulin nondependent.

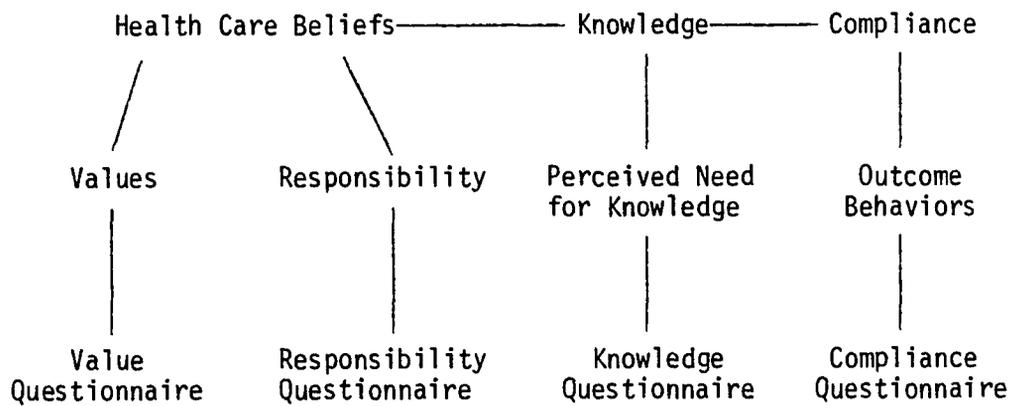


Figure 1. Conceptual Framework for Study

Client - a role one assumes in the health care system and who is diagnosed with type I or type II adult onset diabetes mellitus.

Summary

Because diabetes mellitus affects such a large segment of the population in the United States, it is highly desirable that this susceptible population fully understands the potential impact of this disease. The incidence, potential consequences and complications of diabetes mellitus merit further study. The conceptual framework was based on the Health Belief Model by Hochbaum, as described by Devon and Powers (1984), and the questionnaires were designed to gather information regarding health care beliefs, knowledge and behaviors in persons with diabetes mellitus.

CHAPTER 2

REVIEW OF THE LITERATURE

The relationships among health care beliefs, knowledge and compliance were explored through a selected review of the literature. Research suggests that health education and the manner in which physicians interact with their patients can have a strong impact on medical outcomes (Campbell et al. 1983). Hunt et al. (1983) cited two traditional themes underlying the patient-physician relationship as "the doctor knows best" and "patients know what is best for them and usually do as they please." Hunt et al. (1983, p. 301) proposed a third assumption, "what's best for people can emerge from a reciprocal relationship between patient and physician." "It is important for nurses as health teachers to assume responsibility for initiating an evaluation of patient knowledge about medications and to coordinate efforts with those of the medical staff to ensure a greater quality and effectiveness of teaching practices" (Leary 1971, p. 1194).

Smith (1983) cited that it is not only the type of information presented to a patient but also the way in which it is presented that influences the retention of information. Smith (1983) stated that to maximize patient retention of information it must be presented as part of a continuous process, practical, concise, readily understood and the patient must have motivation to participate. The preceding documentation

supports the need for an informative relationship between patient and health care provider.

Health Care Beliefs

The Health Belief Model (HBM) created by Hochbaum (1958); later revised by Haefner and Kirscht (1970), Becker (1974), and Rosenstock (1975), dealt with the concepts of beliefs, attitudes and values (Devon and Powers 1984). The HBM proposed that if an individual was motivated to avoid a disease, he must believe the following: 1) that he was potentially vulnerable to it, 2) that the disease would have a moderately severe impact on some aspect of his life, 3) that by following a certain action his vulnerability to the disease was lessened or that if he acquired the disease, its severity would be reduced, and 4) that following such an action would exclude overcoming psychological barriers such as cost, pain, convenience, and embarrassment (Becker 1974).

A revised edition of the HBM (Becker, Drachman and Kirscht 1970) was used to predict compliance through positive health motivators in pediatric situations. To expand the function of the HBM, Becker (1976) applied moderator variables to the model that interact with health behavior. Moderator variables were categorized under topics such as demographic social-psychological, reference group influence, and knowledge of disease and treatment (Devon and Powers 1984). Devon and Powers (1984) conducted a study with 30 hypertensive patients to evaluate the influence of moderator variables and found no significant difference in a control and noncontrol group in health beliefs affecting compliance.

Rokeach (1973, p. 3) conceived of human values formulated on the five following assumptions:

1. The total number of values that a person possesses is relatively small.
2. All men everywhere possess the same values to different degrees.
3. Values are organized into value systems.
4. The antecedents of human values can be traced to cultures, society and its institutions, and personality.
5. The consequences of human values will be manifested in virtually all phenomena that social scientists might consider worth investigating and understanding.

Rokeach (1973, p. 5) stated value concepts should avoid circular terms and defined a value as

"an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence and a value system in an enduring organization of beliefs concerning preferable modes of conduct or end-states of existence along a continuum of relative importance."

Rosser (1971) contended that one's health behavior depends partially on one's opinions, beliefs, values and attitudes and that these variables must be considered in an effort to achieve a desired end. Rosser differentiated among beliefs, attitudes and values according to Krathwohl et al. (1964) approach which categorizes beliefs, attitudes and values based on levels of internalization. In order of degree of internalization from lowest to highest, Krathwohl et al. (1964) ranks

them belief, attitude, value. Rosser (1971) defined belief as an emotional acceptance of a proposition or doctrine; attitude as an affective extension of belief reflecting preference; and value, extending beyond attitude as characterized by an existing quality of certainty and commitment.

The HBM of preventive health behaviors was supported in a study by Kegeles (1963). The study population consisted of 430 corporation managerial and nonmanagerial employees. The results supported the hypothesis that individuals seek preventive dental care based on their feelings regarding susceptibility, severity and benefits of dental care.

Knowledge

Schwartz et al. (1962) conducted a study which examined errors made by chronically ill, elderly patients. Types of medication errors were classified in five categories: omission, self-medication, incorrect dosage, improper timing/sequence and inaccurate knowledge. Within the distribution of error, omission was the most frequent error with inaccurate knowledge second in occurrence. In a study by Curtis (1961), results showed out of a population of 26 in a home care program, only 12 had a partially accurate idea of the purpose of their medication and six out of 10 patients who correctly self-administered their medications were knowledgeable as to the purpose of each medication.

Neely et al. (1968) replicated the Schwartz et al. (1962) study utilizing an outpatient ambulatory population 60 years of age or greater under private medical care. Results again concluded inaccurate knowledge as the second most common occurring medication error. Knowledge error

included incorrect information regarding the purpose of the medication and nonexistent knowledge as to the reason they were taking the medicine. Study findings by Watkins et al. (1967) supported by similar findings from Williams et al. (1967) found positive correlation between client knowledge and performance levels in studies consisting of clients with diabetes mellitus.

Leary et al. (1971) presented a study conducted by seven graduate students to investigate knowledge levels and medication administration. The study population consisted of 267 outpatients on oral life-maintaining medications: digitalis derivatives, anti-coagulants, and nitroglycerin. A questionnaire was devised to assess patients' knowledge levels. The questionnaire had a possibility of 100 total points and after the scores were tabulated, they were grouped according to total number correct into one of three categories: least informed (0-32), less informed (33-64), and informed (65-97). A total of 83.5 percent scored in the least or less informed categories combined. An astounding 49.4 percent comprised the least informed category. Greatest knowledge deficits occurred in the areas of medication side effects and purpose with 72.1 percent of the patients not aware of symptoms that could represent potentially harmful side effects.

Marks and Clark (1972) conducted a study of 60 hospitalized patients to ascertain patients' knowledge of drugs, drug information-acquiring techniques and attitudes to new-gained information. The findings indicated that patients possessed inadequate medication information as exemplified by knowledge deficits in the areas of medication side

effects, dangers and frequency of administration. Another finding concluded that a large portion of patients desired further knowledge about their medication but would not request it.

Hecht (1974) conducted a study with adults who had tuberculosis and her findings supported a positive relationship between knowledge and medication compliance supported by a significant reduction in medication errors from 53 percent in the control group to 17 percent in the medication education group. "Implicit in a high medication error frequency is the failure of health professionals to make enough of an impression on patients to ensure their following instructions" (Hecht 1970, p. 30).

In a study by Beggan et al. (1982) results of research related to diabetes mellitus found a general deficiency in knowledge of patient-related diabetic management. Jacobson and O'Rourke (1983), in evaluating a diabetic teaching program at an Air Force medical center concluded the benefits of the education program are to decrease hospitalization and increase provider productivity. Paulozzi et al. (1984) conducted a study to evaluate the effects of a model program of education on diabetes mellitus for outpatients and they found a significant improvement in diabetic control with patient education. Results published by Morisky et al. (1984) show the positive effects of patient education on compliance in the areas of appointment keeping, weight control and blood pressure control.

Compliance

"Medication compliance is reported to be one of the more difficult problems facing physicians who treat elderly, chronically ill

patients" (Coe et al. 1984, p. 589). "Making an appropriate diagnosis and writing out the necessary prescription does not guarantee the patient will understand what is required and will follow through with the appropriate health action" (King and Peck 1981, p. 954). At least 30 percent of all ambulatory patients do not take their medications accurately, however, improved education techniques have demonstrated improved patient compliance with medication regimens (Davis 1971). Blackwell (1972) affirmed that 25-50 percent of all outpatients are noncompliant and Ouslander (1981) attested to numerous studies indicating 33-50 percent of elderly clients are noncompliant to some extent.

Vincent (1971) found that compliance in a population with glaucoma was directly and positively correlated with the time the patient reached resolution between his sick role and his normal social role. Compliance requires self-regulation in such diseases as diabetes mellitus (Stroebe and Glueck 1981). "The patient must also accept responsibility for his or her role in medication therapy and a patient is more likely to follow a prescribed regimen if he or she feels this role is important" (Smith 1983, p. 297). In a study by Given et al. (1983) health belief concepts among ambulatory patients with diabetes mellitus were examined out of a population of 156 diabetics and results indicated that patients with diabetes mellitus did not feel responsibility for their therapy. Given et al. (1983) also found questionnaire results supported multiple rationalizations to escape self-responsibility and to actively recruit significant others to participate in the patient's diabetic care, thus transferring and/or evading the responsibility.

Blackwell (1972) addressed patients who were noncompliant with medications as drug defaulters. He stated that drug defaulters were encouraged by complex drug regimens, increased incidence of side effects and prolonged duration of drug therapy. Other factors Blackwell found in this study influencing compliance were a positive social milieu, middle-class socioeconomic status, perceived severity of the illness, and patient attitudes about the medication. Anderson and Kirk (1982) cited the following factors as influencing compliance: 1) human factors, 2) illness factors, and 3) regimen factors. Green et al. (1982) conducted a study with long-term chronically ill patients using the Health Belief and Social Network Models and found that medication compliance is influenced by the following:

1. Patient beliefs, perceptions and disease knowledge
2. Extent of social support for health behaviors
3. Complexity of and specific knowledge about the regimen
4. Satisfaction with clinical encounters and health care facilities.

In a study by Chaney et al. (1967) involving a pediatric population it was found that a mother's perception of the degree of seriousness of a pediatric illness was directly proportional to the degree of medication compliance.

In a literature review by Peck and King (1982) medication non-compliance was addressed. Eight methods of improving patient compliance were outlined:

1. Improved doctor-patient interaction

2. Fear-arousing health messages
3. Education
4. Written instructions
5. Unique drug packaging
6. Tailoring
7. Self-monitoring
8. Contingency monitoring

The study concluded that fear-arousing health messages increased patient education and improved doctor-patient communication necessary for compliance. Other critical strategies such as written instructions, unique drug packaging, tailoring, self-monitoring and contingency monitoring are necessary for maximum compliance.

A survey of New Jersey private physicians conducted in 1981 was designed to collect information on the numbers of hypertensive patients, perceived compliance by practitioner and attitudes of the practitioners toward the noncompliant patient. Responses estimated greatest compliance with appointment and oral medication and least compliance with diet, exercise and self-monitoring (Supino et al. 1984).

Roter (1983) addressed patient-physician communication as an integral variable in achieving compliance. "When patients perceived an ongoing state of communication with their provider, they were more likely to be correct about the action and purpose of their drugs and to comply with prescribed regimens" (German et al. 1982, p. 570).

Summary

The literature review substantiates the relationship between level of knowledge and level of compliance. Other contributory factors are one's perceived health needs and one's sense of self-responsibility for disease management. The literature also examined contributory factors for increasing one's level of knowledge and factors influencing level of compliance

CHAPTER 3

METHODOLOGY

The focus of this study was the relationships among health care beliefs, knowledge level and resultant compliance in subjects diagnosed with adult onset type I or type II diabetes mellitus. This chapter presents the research design, setting, sample population, instruments, data collection and data analysis.

Design of the Study

The study was descriptive and designed to examine the relationships among health care beliefs, knowledge and compliance in clients with type I and type II adult onset diabetes mellitus. The differences among health care beliefs, knowledge and compliance between type I and type II groups were also examined.

Setting

The client population for this study was obtained from a county home health agency in a middle-sized southwestern city which generally serves the elderly, disabled and/or indigent populations. A letter of support was obtained from the administrator of the county home health agency regarding the participation of agency clients (Appendix A).

The client population consisted of those diagnosed with type I or type II adult onset diabetes mellitus. Clients were initially

contacted by telephone by the investigator who was introduced as a graduate student in nursing. The study was briefly described including the participants' involvement. The investigator assured each client that participation was voluntary and would in no way affect their medical and nursing health care services. After the clients agreed to participate, a mutually agreeable interview time was made.

Sample

The sample consisted of two groups of clients with diagnosed type I or type II adult onset diabetes mellitus. Seventeen clients were in each group. All participants had been followed within the past year by a home health nurse from a local county home health agency for counseling, education and management of diabetes mellitus. All participants were able to read, write and understand English although secondary to visual deficiency and peripheral neuropathy, 11 participants requested that the investigator read the Data Information Sheet and the four questionnaires to them and record their responses for them.

Protection of Human Subjects

The proposal was submitted to and deemed exempt by the Ethical Review Committee of the College of Nursing (Appendix B). All subjects were volunteers, were nonpaid, and all information collected was held confidential as participants were identified by a code number only. Each subject was given a written disclaimer (Appendix C) and was told that he/she could withdraw from the study at any time without jeopardizing their health care.

Data Collection Instruments

Data concerning the relationships among health care beliefs, knowledge and compliance were collected by four questionnaires: the Value Questionnaire (Appendix D), the Responsibility Questionnaire (Appendix E), the Knowledge Questionnaire (Appendix F) and the Compliance Questionnaire (Appendix G). The Data Information Sheet was used to obtain additional personal information (Appendix H).

Each instrument was reviewed for content validity by three public health nurses and one public health nursing supervisor, all of whom have extensive experience in client teaching, management and supervision of type I and type II adult onset diabetes mellitus. Suggestions were made to increase the readability, understanding and clinical utility of the instruments and appropriate alterations were made. Also each instrument was reviewed by three persons with diagnosed adult onset diabetes mellitus who verified that the questionnaires were readable and understandable.

The value, responsibility, knowledge and compliance questionnaires were developed by the investigator based on a literature review which supported the existence of relationships among the variables: health care beliefs, knowledge and compliance. Rosser (1971) stated that there existed a relationship between one's opinions, beliefs and values and one's health behavior and that these variables must be considered to achieve a desired end. Smith (1983) concluded a person is more likely to assume independent responsibility for his or her disease management if he or she feels that role to be important to his or her

prescribed regimen. Hecht (1974) conducted a study with adults diagnosed with tuberculosis and his findings supported a positive relationship between knowledge and medication compliance. In a study by Given et al. (1983) results indicated that clients with type I or type II adult onset diabetes mellitus out of a study population of 156 did not feel responsibility for their therapy. Green et al. (1982) conducted a study with long-term chronically ill clients and found that medication compliance is influenced by patient beliefs, perceptions and disease knowledge.

The Demographic Data Sheet (Appendix I) was developed by the investigator to obtain data regarding these subjects and compare it to the 1984 statistics issued by the American Diabetes Association and to delineate between type I and type II groups so that they could be statistically compared. The instrument contained 12 items designed to ascertain information about the participants regarding the following: age, sex, insulin dependent or nondependent, ethnicity, level of academic education received, year diagnosed with type I or type II adult onset diabetes mellitus, average annual income, weight/height ratio to determine weight within or exceeding normal limits, occurrence including year and type of teaching, whether written or verbal received by the participant. Seven of the items required a checkmark to designate the participant's response whereas five of the items required that the participant record numbers.

Health care beliefs were estimated by two ordinal-scaled questionnaires focusing on values and responsibilities. The Value Questionnaire originated by Rokeach (1973) served as a guide for this Value

Questionnaire. The Rokeach Value Questionnaire consisted of two lists of 18 alphabetically arranged items each followed by a brief definition which the participants were requested to rank in order of individual importance. The Rokeach participants reported the ranking task to be very difficult as all 36 values were socially desirable. To avoid that participant hardship, the investigator replaced ranking with a scale eliciting participant feeling of importance. The investigator adapted the value items and reduced the total number of eight to more closely identify with the purpose and client population of this study. The participant was requested to respond to each value as being most important (4), somewhat important (3), least important (2), and not important (1), by circling the number corresponding to the appropriate response option.

A responsibility questionnaire was developed by the investigator using a Likert-type format for participant responses. There were 13 responsibility items presented as statements to which the participants were requested to respond according to their intensity of agreement, disagreement or indecision. Response options were strongly agree (SA), agree (A), undecided (U), disagree (D) and strongly disagree (SD), each of which were assigned a numerical value: five, four, three, two one respectively. The participants were asked to circle the response option with which they agreed for each responsibility item. The word "should" occurred in 11 of the 13 responsibility items because from the investigator's eight years of clinical nursing practice with type I and type II adult onset diabetes mellitus believed that the word "should" is the most commonly used directive to imply responsibility.

The Knowledge Questionnaire was also developed by the investigator. This instrument was designed to test elementary knowledge regarding medication administration, signs and symptoms of hypoglycemia and hyperglycemia, urine testing, skin care, diet and the pathology of diabetes mellitus. The Knowledge Questionnaire was carefully designed so that all the questions except those regarding urine testing, would be applicable for both type I and type II participants. The questionnaire included 16 questions, each question with four choices, the fourth choice always being "I do not know." Question 14 consisted of parts a, b and c, with the participant instructed to answer that question which pertained to the urine testing technique that they were presently using. Each question had only one correct answer and the results of the questionnaire were analyzed according to each participant's total number of correct responses.

The Compliance Questionnaire also developed by the investigator contained six items designed to elicit frequency of disease-related behavior generally expected. The participants were requested to select the response options most closely resembling their individual practices for each compliance item using a multiple choice format.

Data Collection Protocol

The interviews were conducted by the investigator in the participant's home and lasted approximately one hour. The participants were informed of the purpose of the study and their role in the study. The Disclaimer was explained in detail to the participant. The investigator explained the procedure for the Data Information Sheet and the four

questionnaires individually. Participants were asked to answer all of the items, if possible, and to give only one answer per item. Each participant was asked to complete the Data Information Sheet and the four questionnaires in the following order: Data Information Sheet, Value Questionnaire, Responsibility Questionnaire, Knowledge Questionnaire and Compliance Questionnaire.

Data Analysis

Methods of data analysis for this study consisted of frequencies, correlations and t-tests. Analysis was done on the demographic data and the four questionnaires. Differences between type I and type II groups with adult onset diabetes mellitus were identified.

Frequencies were computed on all the instruments, item-by-item. The level of statistical significance was set at $p \leq 0.05$. Pearson's Product Moment Correlation Coefficients were estimated for all the instruments item-by-item. Internal consistency reliability was estimated on the Value and Responsibility Questionnaires at Alpha (α) = .70 and .64 respectively.

Summary

The methodology for this descriptive study used a correlational design examining the relationships among health care beliefs, knowledge and compliance. Data collection instruments consisted of a demographic sheet and four questionnaires. The results of the data collection were analyzed to ascertain the relationships among the variables.

CHAPTER 4

PRESENTATION OF DATA

This study was designed to examine the relationships among health care beliefs, knowledge and compliance in clients with type I (Group I) and type II (Group II) adult onset diabetes mellitus. This chapter presents characteristics of the sample and statistical analysis of the data.

Characteristics of the Sample

The sample consisted of 34 clients from a local county home health agency. Seventeen clients were diagnosed with type I (Group I) adult onset diabetes mellitus and 17 with type II (Group II) adult onset diabetes mellitus. There were 15 males (44%) and 19 females (56%). In Group I, there were seven males (41%) and 10 females (59%). In Group II, there were eight males (47%) and nine females (53%) (Table 1). According

Table 1. Characteristics of Subjects by Sex

	(N=34)		
SEX	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Males	7 (41)	8 (47)	15 (44)
Females	10 (59)	9 (53)	19 (56)
Total	17 (100)	17 (100)	34 (100)

Table 2. Characteristics of Subjects by Age

(N=34)			
AGE in Years	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
40-50	2 (12)	2 (12)	4 (12)
51-60	4 (24)	4 (24)	8 (21)
61-70	7 (42)	4 (24)	11 (34)
71-80	4 (24)	6 (36)	10 (30)
81-90	0 (0)	1 (6)	1 (3)
Total	17 (100)	17 (100)	34 (100)

to the American Diabetes Association (1984), women are 50 percent more likely to contract type I or type II adult onset diabetes mellitus than men. In Group I, ages ranged from 42-80 years with a mean age of 64.05, and a standard deviation of 11.22. In Group II, ages ranged from 48-85 years with a mean age of 65.64 and a standard deviation of 11.87. The total sample's ages ranged from 42-85 years with a mean age of 64.85 and a standard deviation of 11.40 years (Table 2). According to the American Diabetes Association (1984), the susceptible population for type I or type II adult onset diabetes mellitus is over 40 years of age. The study sample is in accord with American Diabetes Association statistics.

In Group I, 10 (59%) were White, four (24%) were Black and three (18%) were Hispanic. In Group II, 12 (71%) were White, two (12%) were Black and three (18%) were Hispanic. In the total sample, 22 (65%) were White, six (18%) were Black and six (18%) were Hispanic (Table 3). According to the American Diabetes Association (1984), non-Whites are 20 percent more susceptible to type I or type II adult onset diabetes mellitus than Whites. The total sample of this study constituted 29 percent more Whites than non-Whites.

Table 3. Characteristics of Subjects by Ethnicity

(N=34)			
ETHNIC GROUP	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
White	10 (58)	12 (70)	22 (64)
Black	4 (24)	2 (12)	6 (18)
Hispanic	3 (18)	3 (18)	6 (18)
Total	17 (100)	17 (100)	34 (100)

The level of education of the subjects was recorded as the highest grade of school completed (Table 4). In Group I, four (24%) completed grades 1-6, four (24%) completed grades 7-8, six (35%) completed grades 9-12 and three (18%) completed college. In Group II, one (6%) completed grades 1-6, four (24%) completed grades 7-8, nine (53%) completed grades 9-12 and three (18%) completed college. In the total sample, five (15%) completed grades 1-6, eight (24%) completed grades 7-8, 15 (44%) completed grades 9-12 and six (18%) completed college.

Table 4. Characteristics of Subjects by Education

(N=34)			
Level of EDUCATION	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
1-6	4 (24)	1 (6)	5 (15)
7-8	4 (24)	4 (24)	8 (24)
9-12	6 (34)	9 (52)	15 (43)
College	3 (18)	3 (18)	6 (18)
Total	17 (100)	17 (100)	34 (100)

Table 5. Year Subjects Were Diagnosed With Diabetes Mellitus

(N=33)			
YEAR DIAGNOSED	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
1985-1980	6 (36)	5 (30)	11 (33)
1979-1975	3 (18)	2 (12)	5 (15)
1974-1970	3 (18)	2 (12)	5 (15)
1969-1965	1 (6)	4 (24)	5 (15)
1964-1960	3 (18)	1 (6)	4 (12)
1959-1955	0 (0)	1 (6)	1 (3)
1954-1950	0 (0)	1 (6)	1 (3)
1949-1945	1 (6)	0 (0)	0 (0)
Total	17 (100)	16 (100)	33 (100)

The year that subjects were diagnosed with type I or type II adult onset diabetes mellitus was requested to obtain information regarding longevity of the disease process (Table 5). In Group I, six (36%) were diagnosed between 1980-1985, three (18%) were diagnosed between 1975-1979, three (18%) were diagnosed between 1970-1974, one (6%) was diagnosed between 1965-1969, three (18%) were diagnosed between 1960-1964, none were diagnosed between 1955-1959 and one (6%) was diagnosed between 1950-1954. In Group II, five (30%) were diagnosed between 1980-1985, two (12%) were diagnosed between 1975-1979, two (12%) were diagnosed between 1970-1974, four (24%) were diagnosed between 1965-1969, one (6%) was diagnosed between 1960-1964, one (6%) was diagnosed between 1955-1959, and one (6%) was diagnosed between 1950-1954. In the total sample, 11 (33%) were diagnosed between 1980-1985, five (15%) were diagnosed between 1975-1979, five (15%) were diagnosed between 1970-1974, five (15%) were

diagnosed between 1965-1969, four (12%) were diagnosed between 1960-1964, one (3%) was diagnosed between 1955-1959, none were diagnosed between 1950-1954 and one (3%) was diagnosed between 1945-1949.

In Group I, 13 (76%) participants indicated they had an income greater than \$5,000 per year (Table 6). In Group II, 11 (65%) participants indicated they had an income less than \$5,000 per year and six (35%) indicated they had an income greater than \$5,000 per year. In the total sample, 24 (71%) participants indicated they had an income less than \$5,000 per year and 10 (29%) indicated they had an income greater than \$5,000 per year. Results of this study reflect the American Diabetes Association's (1984) statistics, as there were 150 percent more subjects with an income less than \$5,000 annually.

The relationship of height and weight was evaluated according to an established table (Walser et al. 1984, p. 384) (Appendix I). Participants were considered to weigh within normal limits as long as their weight did not exceed the high limit in the large frame category for a specific height. If the participant's weight did exceed the high

Table 6. Distribution of Subjects by Income

(N=34)			
INCOME	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Less than \$5,000/Year	13 (76)	11 (65)	24 (71)
Greater than \$5,000/Year	4 (24)	6 (35)	10 (29)
Total	17 (100)	17 (100)	34 (100)

Table 7. Distribution of Subjects by Weight

(N=34)			
WEIGHT	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Weight Within Normal Limits	9 (53)	8 (47)	17 (50)
Overweight	8 (47)	9 (53)	17 (50)
Total	17 (100)	17 (100)	34 (100)

value of the large frame category for a specific height, the participant was considered overweight. In Group I, nine (53%) weighed within normal limits and eight (47%) were overweight. In Group II, eight (47%) weighed within normal limits and nine (53%) were overweight. In the total sample, 17 (50%) weighed within normal limits and 17 (50%) were overweight (Table 7). The findings indicated an equal distribution of normal weight versus overweight while the American Diabetes Association (1984) identified the susceptible population as overweight.

In Group I, 14 (82%) had received diabetic teaching and three (18%) had not (Table 8). In Group II, 15 (91%) had received diabetic

Table 8. Distribution of Subjects by Diabetic Teaching

(N=34)			
DIABETIC TEACHING	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Yes	14 (82)	15 (91)	29 (85)
No	3 (18)	2 (9)	5 (15)
Total	17 (100)	17 (100)	34 (100)

teaching and two (9%) had not. In the total sample, 29 (85%) of the participants had received diabetic teaching and five (15%) had not.

The time lapsed since participants received diabetic teaching was calculated by the number of years since diabetic teaching was first received (Table 9). In Group I, eight (57%) had received diabetic teaching within the past 10 years, three (21%) had received it within the past 10 to 20 years, two (14%) had received it within the past 20 to 30 years and one (7%) had received it more than 30 years ago. In Group II, five (33%) had received their diabetic teaching within the past 10 years, five (33%) had received it within the past 10 to 20 years, three (21%) had received it within the past 20 to 30 years and two (14%) had received it over 30 years ago. In the 29 participants who had received diabetic teaching, 13 (45%) participants had received it within the past 10 years, eight (27%) had received it in the past 10 to 20 years, seven (24%) had received it in the past 20 to 30 years and one (3%) had received it over 30 years ago.

Table 9. Time Lapsed in Years Since Diabetic Teaching

(N=29)			
TIME LAPSED in Years	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
0-10	8 (58)	5 (33)	13 (46)
10-20	3 (21)	5 (33)	8 (27)
20-30	2 (14)	3 (21)	7 (24)
30	1 (7)	2 (13)	1 (3)
Total	14 (100)	15 (100)	29 (100)

Table 10. Type of Diabetic Teaching Received

TYPE	(N=29)		
	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Verbal	12 (86)	13 (86)	25 (85)
Written	2 (14)	2 (14)	4 (15)
Total	14 (100)	15 (100)	29 (100)

The final demographic item considered was whether the participants' diabetic teaching was in verbal form or written form (Table 10). In Group I, 12 (86%) received verbal instruction and two (14%) received written instruction. In Group II, 13 (86%) received verbal instruction and two (14%) received written instruction. In the total sample, 25 (75%) received verbal instruction, four (12%) received written instruction and five (15%) had not received any diabetic instruction.

Item Analysis of Questions

Value Questionnaire

An eight-item value questionnaire was used to determine the degree of importance viewed by the participants for each item (Appendix D). Frequency distributions of the raw data from individual responses for Group I, Group II and the total sample are shown in Appendix J. The response options were "very important," "somewhat important," "least important" and "not important" with numerical values of 4, 3, 2, 1 respectively. The possible range of scores was 8-32. Group I had a total scale mean of 28.29 and a standard deviation of 2.64. Group II had a total scale mean of 26.59 and a standard deviation of 3.84. The total

sample had a total scale mean of 27.44 with a standard deviation of 3.36. The mean and standard deviation of each item for Group I, Group II and the total sample are shown in Table 11.

Value 1, adaptability was defined as the ability to accept change. For Group I, 13 (76%) participants responded to "very important," three (18%) participants to "somewhat important" and one (6%) participant to "least important." There were no responses to "not important." The range was 2.0 to 4.0, the mean was 3.71 and the standard deviation was .59. For Group II, 10 (59%) participants responded to "very important," six (35%) participants to "somewhat important," one (6%) participants to "least important" and no responses for "not important." The range was 2.0 to 4.0, the mean was 3.53 and the standard deviation was .62. For the total sample, 23 (68%) participants responded to "very important," nine (26%) participants to "somewhat important" and two (6%) participants to "least important." There were no responses to "not important." The range was 2.0 to 4.0, the mean was 3.62 and the standard deviation was .60.

Value 2, comfort, was defined as ease of life. For Group I, 14 (82%) participants responded to "very important," two (12%) participants to "somewhat important," one (6%) participants to "least important" and no responses to "not important." The range was 2.0 to 4.0, the mean was 3.77 and the standard deviation was .56. For Group II, nine (53%) participants responded to "very important," seven (41%) participants to "somewhat important," one (6%) participant to "least important" and no responses to "not important." The range was 2.0 to 4.0, the mean was

Table 11. Results of the Value Questionnaire: Mean and Standard Deviation for Each Item

(N=34)

VALUE	Group I		Group II		Total	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
1	3.71	0.59	3.53	0.62	3.62	0.60
2	3.77	0.56	3.47	0.62	3.62	0.60
3	3.29	0.85	2.77	1.03	3.02	0.97
4	3.47	0.87	3.06	1.20	3.27	1.05
5	3.77	0.44	3.71	0.47	3.74	0.45
6	3.71	0.47	3.77	0.44	3.74	0.45
7	3.89	0.33	3.53	0.87	3.71	0.68
8	2.71	0.85	2.77	0.90	2.74	0.86

Response Range: 1 (Low) to 4 (High)

3.47 and the standard deviation was .62. For the total sample, 23 (68%) participants responded to "very important," nine (26%) participants to "somewhat important," two (6%) participants to "least important" and there were no responses to "not important." The range was 2.0 to 4.0, the mean was 3.62 and the standard deviation was .60.

Value 3, body image, was defined as how you look. For Group I, eight (47%) participants responded to "very important," seven (41%) participants to "somewhat important," one (6%) participant to "least important" and one (6%) participant to "not important." The range was 1.0 to 4.0, the mean was 3.29 and the standard deviation was .85. For Group II, four (24%) participants responded to "very important," eight (47%) participants to "somewhat important," two (12%) participants to "least important" and three (18%) participants to "not important." The range was 1.0 to 4.0, the mean was 2.77 and the standard deviation was 1.03. For the total sample, 12 (35%) participants responded to "very important," 15 (44%) participants to "somewhat important," two (9%) participants to "least important," and four (12%) participants to "not important." The range was 1.0 to 4.0, the mean was 3.02 and the standard deviation was .97.

Value 4, family support, was defined as family assistance. For Group I, 11 (65%) participants responded to "very important," four (24%) participants to "somewhat important," one (6%) participant to "least important" and one (6%) participant to "not important." The range was 1.0 to 4.0, the mean was 3.47 and the standard deviation was .87. For Group II, nine (53%) participants responded to "very important," three (18%) participants to "somewhat important," two (12%) participants to

"least important" and three (18%) participants to "not important." The range was 1.0 to 4.0, the mean was 3.06 and the standard deviation was 1.20. For the total sample, 20 (59%) participants responded to "very important," seven (21%) participants to "somewhat important," three (9%) participants to "least important" and four (12%) participants to "not important." The range was 1.0 to 4.0, the mean was 3.27 and the standard deviation was 1.05.

Value 5, responsibility, was defined as doing for yourself. For Group I, 13 (76%) participants responded to "very important," four (24%) participants to "somewhat important" and there were no responses to "least important" or "not important." The range was 3.0 to 4.0, the mean was 3.77 and the standard deviation was .44. For Group II, 12 (71%) participants responded to "very important," five (29%) participants to "somewhat important" and there were no responses to "least important" or "not important." The range was 3.0 to 4.0, the mean was 3.71 and the standard deviation was .47. For the total sample, 25 (74%) participants responded to "very important," nine (26%) participants to "somewhat important" and there were no responses to "least important" or "not important." The range was 3.0 to 4.0, the mean was 3.74 and the standard deviation was .45.

Value 6, self-esteem, was defined as self-respect. For Group I, there were 12 (71%) participant responses to "very important," five (29%) to "somewhat important" and there were no responses to "least important" or "not important." The range was 3.0 to 4.0, the mean was 3.71 and the standard deviation was .47. For Group II, 13 (76%) participants

responded to "very important," four (24%) participants to "somewhat important" and there were no responses to "least important" or "not important." The range was 3.0 to 4.0, the mean was 3.77 and the standard deviation was .44. For the total sample, 25 (74%) participants responded to "very important," nine (26%) participants to "somewhat important" and there were no responses to "least important" or "not important." The range was 3.0 to 4.0, the mean was 3.74 and the standard deviation was .45.

Value 7, control, was defined as independent life management. For Group I, 15 (88%) participants responded to "very important," two (12%) participants to "somewhat important" and there were no responses to "least important" or "not important." The range was 3.0 to 4.0, the mean was 3.89 and the standard deviation was .33. For Group II, 12 (71%) participants responded to "very important," three (18%) participants to "somewhat important," one (6%) participant to "least important" and one (6%) participant to "not important." The range was 1.0 to 4.0, the mean was 3.53 and the standard deviation was .87. For the total sample, 27 (79%) participants responded to "very important," five (15%) participants to "somewhat important," one (3%) participant to "least important" and one (3%) participant to "not important." The range was 1.0 to 4.0, the mean was 3.71 and the standard deviation was .68.

Value 8, dependence, was defined as allowing others to provide care. For Group I, three (18%) participants responded to "very important," seven (41%) participants to "somewhat important," six (35%) participants to "least important" and one (6%) participant to "not

important." The range was 1.0 to 4.0, the mean was 2.71 and the standard deviation was .85. For Group II, four (24%) participants responded to "very important," six (35%) participants to "somewhat important," six (35%) participants to "least important" and one (6%) participants to "not important." The range was 1.0 to 4.0, the mean was 2.77 and the standard deviation was .90. For the total sample, seven (21%) participants responded to "very important," 13 (38%) participants to "somewhat important," 12 (35%) participants to "least important" and two (6%) participants to "not important." The range was 1.0 to 4.0, the mean was 2.74 and the standard deviation was .86.

Results of the analysis of the Value Questionnaire indicated a similarity in response between Group I and Group II. Total sample response indicated an 88 percent average response for "very important" and "somewhat important."

Responsibility Questionnaire

A 13-item responsibility questionnaire was used to determine the degree of agreement viewed by the participants for each item (Appendix E). Frequency distributions of the raw data for individual responses for Group I, Group II and the total sample are shown in Appendix K. The response options were "strongly agree," "agree," "undecided," "disagree," "strongly disagree" with assigned point values of 5, 4, 3, 2, and 1 respectively. For items 3, 5 and 7 the assigned point values were reversed. The possible range of scores was 13-65. Group I had a total scale mean of 50.82 and a standard deviation of 4.25. Group II had a total scale mean of 50.94 and a standard deviation of 5.71. The total sample had a

total scale mean of 50.88 and a standard deviation of 4.95. The mean and standard deviation of each item for Group I, Group II and the total sample are shown in Table 12.

For Responsibility 1, persons with diabetes mellitus should have yearly checkups, Group I responses were 13 (76%) "strongly agree," four (24%) "agree" and no responses for "undecided," "disagree" and "strongly disagree." For Group II, responses were 11 (65%) "strongly agree," six (35%) "agree" and no responses for "undecided," "disagree" and "strongly disagree." The mean was 4.65 and the standard deviation was .49. Total sample responses were 24 (71%) "strongly agree," 10 (29%) "agree" and no responses for "undecided," "disagree," "strongly disagree." The mean was 4.71 and the standard deviation was .46.

For Responsibility 2, persons with diabetes mellitus should follow the doctor's orders, Group I responses were 15 (88%) "strongly agree," two (12%) "agree" and no responses for "undecided," "disagree" and "strongly disagree." The mean was 4.88 and the standard deviation was .33. For Group II, responses were 13 (76%) "strongly agree," three (18%) "agree," one (6%) "disagree" and no responses for "undecided" and "strongly disagree." The mean was 4.65 and the standard deviation was .79. Total sample responses were 28 (82%) "strongly agree," five (15%) "agree," one (6%) "disagree," and no responses for "undecided" and "strongly disagree." The mean was 4.77 and the standard deviation was .61.

For Responsibility 3, persons with diabetes mellitus should take advice from other persons with diabetes mellitus rather than from the doctor. Group I responses were seven (41%) "strongly agree," six (35%)

Table 12. Results of the Responsibility Questionnaire: The Mean and Standard Deviation for Each Item

(N=34)

RESPONSIBILITY	Group I		Group II		Total	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
1	4.77	0.44	4.65	0.49	4.71	0.46
2	4.88	0.33	4.65	0.79	4.77	0.61
3	3.88	1.36	3.88	1.27	3.88	1.30
4	4.41	0.62	4.47	0.62	4.44	0.61
5	2.29	1.21	2.35	1.27	2.32	1.22
6	3.82	1.13	3.59	1.06	3.71	1.09
7	1.88	0.86	2.24	0.75	2.06	0.81
8	4.41	0.62	4.35	0.79	4.38	0.70
9	4.18	0.81	3.71	1.21	3.94	1.04
10	4.35	0.61	4.24	0.66	4.29	0.63
11	3.94	0.75	4.35	0.86	4.15	0.82
12	4.00	0.71	4.18	0.81	4.09	0.75
13	4.00	0.79	4.29	0.92	4.15	0.86

"agree," one (6%) "undecided," one (6%) "disagree" and two (12%) "strongly disagree." The mean was 3.88 and the standard deviation was 1.36. For Group II, responses were seven (41%) "strongly agree," five (29%) "agree," two (12%) "undecided," two (12%) "disagree," and one (6%) "strongly disagree." The mean was 3.88 and the standard deviation was 1.27. Total sample responses were 14 (41%) "strongly agree," 11 (32%) "agree," three (9%) "undecided," three (9%) "disagree" and three (9%) "strongly disagree." The mean was 3.88 and the standard deviation was 1.30.

For Responsibility 4, persons with diabetes mellitus should learn as much as possible about diabetes mellitus, Group I responses were eight (47%) "strongly agree," eight (47%) "agree," one (6%) "undecided" and no responses for "disagree" and "strongly disagree." The mean was 4.41 and the standard deviation was .62. For Group II, responses were nine (53%) "strongly agree," seven (41%) "agree," one (6%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 4.47 and the standard deviation was .62. Total sample responses were 17 (50%) "strongly agree," 15 (44%) "agree," two (6%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 4.44 and the standard deviation was .61.

For Responsibility 5, it is the doctor's responsibility to know as much as possible about diabetes mellitus not the patient's responsibility, Group I responses were four (24%) "agree," three (18%) "undecided," four (24%) "disagree," six (35%) "strongly disagree" and no responses for "strongly agree." The mean was 2.29 and the standard deviation was 1.21. For Group II, responses were one (6%) "strongly agree," three (18%)

"agree," two (12%) "undecided," six (65%) "disagree" and five (29%) "strongly disagree." The mean was 2.35 and the standard deviation was 1.27. Total sample responses were one (3%) "strongly agree," seven (21%) "agree," five (15%) "undecided," 10 (29%) "disagree" and 11 (32%) "strongly disagree." The mean was 2.32 and the standard deviation was 1.22.

For Responsibility 6, persons with diabetes mellitus should independently manage their disease, Group I responses were six (35%) "strongly agree," five (29%) "agree," three (18%) "undecided," three (18%) "disagree" and no responses for "strongly disagree." The mean was 3.82 and the standard deviation was 1.13. For Group II, responses were four (24%) "strongly agree," five (29%) "agree," five (29%) "undecided," three (18%) "disagree" and no responses for "strongly disagree." The mean was 3.59 and the standard deviation was 1.06. Total sample responses were 10 (29%) "strongly agree," 10 (29%) "agree," eight (24%) "undecided," six (18%) "disagree" and no responses for "strongly disagree." The mean was 3.71 and the standard deviation was 1.09.

For Responsibility 7, families of persons with diabetes mellitus should help the person with diabetes mellitus to manage his/her disease, Group I responses were one (6%) "agree," two (12%) "undecided," eight (47%) "disagree," six (35%) "strongly disagree," and no responses for "strongly agree." The mean was 1.88 and the standard deviation was .86. For Group II, responses were one (6%) "agree," four (24%) "undecided," 10 (59%) "disagree," two (12%) "strongly disagree," and no responses for "strongly agree." The mean was 2.24 and the standard deviation was

.75. Total sample responses were two (6%) "agree," six (18%) "undecided," 18 (53%) "disagree," eight (24%) "strongly disagree," and no responses for "strongly agree." The mean was 2.06 and the standard deviation was .81.

For Responsibility 8, persons with diabetes mellitus should follow their diet daily, Group I responses were eight (47%) "strongly agree," eight (47%) "agree," one (6%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 4.41 and the standard deviation was .62. For Group II, responses were nine (53%) "strongly agree," five (29%) "agree," three (18%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 4.35 and the standard deviation was .79. Total sample responses were 17 (50%) "strongly agree," 13 (38%) "agree," four (12%) "undecided" and no responses for "disagree" and "strongly disagree." The mean was 4.38 and the standard deviation was .70.

For Responsibility 9, persons with diabetes mellitus should test their urine daily, Group I responses were seven (41%) "strongly agree," six (35%) "agree," four (24%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 4.18 and the standard deviation was .81. For Group II, responses were five (29%) "strongly agree," six (35%) "agree," three (18%) "undecided," two (12%) "disagree," and one (6%) "strongly disagree." The mean was 3.71 and the standard deviation was 1.21. Total sample responses were 12 (35%) "strongly agree," 12 (35%) "agree," seven (21%) "undecided," two (6%) "disagree," and one (3%) "strongly disagree." The mean was 3.94 and the standard deviation was 1.04.

For Responsibility 10, persons with diabetes mellitus should check their feet for sores daily, Group I responses were seven (41%) "strongly agree," nine (53%) "agree," one (6%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 4.35 and the standard deviation was .61. For Group II, responses were six (35%) "strongly agree," nine (53%) "agree," two (12%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 4.24 and the standard deviation was .66. Total sample responses were 13 (38%) "strongly agree," 18 (53%) "agree," three (9%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 4.29 and the standard deviation was .63.

For Responsibility 11, persons with diabetes mellitus should know the signs of hypoglycemia, Group responses were four (24%) "strongly agree," eight (47%) "agree," five (29%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 3.94 and the standard deviation was .75. For Group II, responses were 10 (59%) "strongly agree," three (18%) "agree," four (24%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 4.35 and the standard deviation was .86. Total sample responses were 14 (41%) "strongly agree," 11 (32%) "agree," nine (26%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 4.15 and the standard deviation was .82.

For Responsibility 12, persons with diabetes mellitus should know the signs of hyperglycemia, Group I responses were four (24%) "strongly agree," nine (53%) "agree," four (24%) "undecided," and no responses for

"disagree" and "strongly disagree." The mean was 4.00 and the standard deviation was .71. For Group II, responses were seven (41%) "strongly agree," six (35%) "agree," four (24%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 4.18 and the standard deviation was .81. Total sample responses were 11 (32%) "strongly agree," 15 (44%) "agree," eight (24%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 4.09 and the standard deviation was .75.

For Responsibility 13, persons with diabetes mellitus should know the treatment for hypoglycemia, Group I responses were five (29%) "strongly agree," seven (41%) "agree," five (29%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 4.00 and the standard deviation was .79. For Group II, responses were 10 (59%) "strongly agree," two (12%) "agree," five (29%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 4.29 and the standard deviation was .92. Total sample responses were 15 (44%) "strongly agree," nine (26%) "agree," 10 (29%) "undecided," and no responses for "disagree" and "strongly disagree." The mean was 4.15 and the standard deviation was .86.

Results of the analysis of the Responsibility Questionnaire indicated a similarity in responses between Group I and Group II. For each item excluding five and seven which were reversed, there was 89 percent agreement for "strongly agree" or "agree." For items five and seven, there was 69 percent agreement for "strongly disagree" or "disagree."

Knowledge Questionnaire

A 16-item knowledge questionnaire was used to assess the amount of accurate knowledge the participants possessed regarding adult onset diabetes mellitus. Each question contained four possible response options: one correct, two incorrect and "I do not know" as the fourth response option. Question 14 had three parts, a, b, or c, consisting of four response options each with "I do not know" as the fourth response option. The participants were to select the question which pertained to the urine testing method they were presently using. The possible range of scores was 1-16. Frequency distributions of response options for each question for Group I, Group II, and the total sample including the number of participants selecting each response option and the percentage are shown in Table 13.

For Question 1, "the body organ that produces insulin is the," the correct answer was 3, "pancreas." For Group I, 12 (70%) answered correctly, two (12%) answered incorrectly, and three (18%) did not know the correct response option. For Group II, 12 (70%) answered correctly, one (6%) answered incorrectly and four (24%) did not know the correct response option. For the total sample, 24 (70%) answered correctly, three (9%) answered incorrectly and seven (21%) did not know the correct response option.

For Question 2, "insulin causes the blood sugar to," the correct answer was 2, "to decrease." For Group I, 13 (76%) answered correctly, three (18%) answered incorrectly and one (6%) did not know the correct response option. For Group II, 12 (71%) answered correctly, three (18%)

Table 13. Results of the Knowledge Questionnaire by Responses to Each Item

	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Question 1 (N=34)			
1	0 (0)	0 (0)	0 (0)
2	2 (12)	1 (6)	3 (9)
*3	12 (70)	12 (70)	24 (70)
4	3 (18)	4 (24)	7 (21)
Total	17 (100)	17 (100)	34 (100)
Question 2 (N=34)			
1	1 (6)	2 (12)	3 (9)
*2	13 (76)	12 (71)	25 (74)
3	2 (12)	1 (6)	3 (9)
4	1 (6)	2 (12)	3 (9)
Total	17 (100)	17 (100)	34 (100)
Question 3 (N=34)			
1	2 (12)	2 (12)	4 (12)
2	1 (6)	1 (6)	2 (6)
*3	13 (76)	11 (65)	24 (71)
4	1 (6)	3 (18)	4 (12)
Total	17 (100)	17 (100)	34 (100)
Question 4 (N=34)			
*1	8 (47)	8 (47)	16 (47)
2	0 (0)	2 (12)	2 (6)
3	1 (6)	1 (6)	2 (6)
4	8 (47)	6 (35)	14 (41)
Total	17 (100)	17 (100)	34 (100)

* Correct response option

Table 13, Continued

	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Question 5 (N=34)			
1	0 (0)	0 (0)	0 (0)
2	13 (18)	1 (6)	4 (12)
*3	13 (76)	11 (65)	24 (71)
4	1 (6)	5 (29)	6 (18)
Total	17 (100)	17 (100)	34 (100)
Question 6 (N=34)			
1	3 (18)	2 (12)	5 (15)
2	2 (12)	0 (0)	2 (6)
*3	11 (64)	10 (59)	21 (61)
4	1 (6)	5 (29)	6 (18)
Total	17 (100)	17 (100)	34 (100)
Question 7 (N=34)			
*1	7 (41)	8 (47)	15 (44)
2	4 (24)	2 (12)	6 (18)
3	5 (29)	2 (12)	7 (21)
4	1 (6)	5 (29)	6 (18)
Total	17 (100)	17 (100)	34 (100)
Question 8 (N=34)			
1	1 (6)	1 (6)	2 (6)
*2	15 (88)	12 (70)	27 (79)
3	1 (6)	0 (0)	1 (3)
4	0 (0)	4 (24)	4 (12)
Total	17 (100)	17 (100)	34 (100)
Question 9 (N=34)			
1	1 (6)	5 (29)	6 (18)
2	1 (6)	2 (12)	3 (9)
*3	14 (82)	5 (29)	19 (55)
4	1 (6)	5 (29)	6 (18)
Total	17 (100)	17 (100)	34 (100)

Table 13, Continued

	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Question 10 (N=34)			
*1	8 (47)	10 (58)	18 (52)
2	6 (35)	2 (12)	8 (24)
3	2 (12)	1 (6)	3 (9)
4	1 (6)	4 (24)	5 (15)
Total	17 (100)	17 (100)	34 (100)
Question 11 (N=34)			
1	6 (35)	2 (12)	8 (24)
*2	7 (41)	9 (52)	16 (46)
3	3 (18)	2 (12)	5 (15)
4	1 (6)	4 (24)	5 (15)
Total	17 (100)	17 (100)	34 (100)
Question 12 (N=34)			
1	0 (0)	1 (6)	1 (3)
*2	9 (53)	11 (64)	20 (58)
3	5 (29)	3 (18)	8 (24)
4	3 (18)	2 (12)	5 (15)
Total	17 (100)	17 (100)	34 (100)
Question 13 (N=33)			
1	4 (24)	4 (24)	8 (24)
2	1 (6)	0 (0)	1 (3)
*3	12 (70)	10 (59)	22 (65)
4	0 (0)	2 (12)	2 (6)
Total	17 (100)	16 (100)	33 (100)
Question 14 (a) (N=16)			
1	9 (53)	0 (0)	0 (0)
*2	8 (47)	5 (29)	13 (38)
3	0 (0)	3 (18)	3 (9)
4	0 (0)	0 (0)	0 (0)
Total	8 (47)	8 (47)	16 (47)

Table 13. Results of the Knowledge Questionnaire by Responses to Each Item

	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Question 14 (b) (N=7)			
1	14 (82) no answer	3 (18)	3 (9)
2	0 (0)	0 (0)	0 (0)
*3	3 (18)	1 (6)	4 (12)
4	0 (0)	0 (0)	0 (0)
Total	3 (18)	1 (6)	4 (12)
Question 14 (c) (N=8)			
1	12 (70) no answer	0 (0)	0 (0)
*2	3 (18)	2 (12)	5 (15)
3	2 (12)	1 (6)	3 (9)
4	0 (0)	0 (0)	0 (0)
Total	5 (30)	3 (18)	8 (24)
Question 15 (N=34)			
*1	12 (70)	9 (52)	21 (61)
2	2 (12)	2 (12)	4 (12)
3	1 (6)	2 (12)	3 (9)
4	2 (12)	4 (24)	6 (18)
Total	17 (100)	17 (100)	34 (100)
Question 16 (N=34)			
*1	11 (64)	10 (58)	21 (61)
2	1 (6)	2 (12)	3 (9)
3	1 (6)	1 (6)	2 (6)
4	4 (24)	4 (24)	8 (24)
Total	17 (100)	17 (100)	34 (100)

answered incorrectly and two (12%) did not know the correct response option. For the total sample, 25 (74%) answered correctly, six (18%) answered incorrectly, and three (9%) did not know the correct response option.

For Question 3, "which complication are persons with diabetes mellitus likely to have," the correct answer was 3, "blindness." For Group I, 13 (76%) answered correctly, three (18%) answered incorrectly and one (6%) did not know the correct response option. For Group II, 11 (65%) answered correctly, three (18%) answered incorrectly and three (18%) did not know the correct response option. For the total sample, 24 (71%) answered correctly, six (18%) answered incorrectly and four (12%) did not know the correct response option.

For Question 4, "which word describes low blood sugar," the correct answer was 1, "hypoglycemia." For Group I, eight (47%) answered correctly, one (6%) answered incorrectly and eight (47%) did not know the correct response option. For Group II, eight (47%) answered correctly, three (18%) answered incorrectly and six (35%) did not know the correct response option. For the total sample, 16 (47%) answered correctly, four (12%) answered incorrectly and 14 (41%) did not know the correct response option.

For Question 5, "how often does a person with diabetes mellitus test his/her urine," the correct answer was 3, "before meals." For Group I, 13 (76%) answered correctly, three (18%) answered incorrectly and one (6%) did not know the correct response option. For Group II, 11 (65%) answered correctly, one (6%) answered incorrectly and five

(29%) did not know the correct response option. For the total sample, 24 (71%) answered correctly, four (12%) answered incorrectly and six (18%) did not know the correct response option.

For Question 6, "what is the cause of an insulin reaction," the correct answer was 3, "too much insulin." For Group I, 11 (64%) answered correctly, five (30%) answered incorrectly and one (6%) did not know the correct response option. For Group II, 10 (59%) answered correctly, two (12%) answered incorrectly and five (29%) did not know the correct response option. For the total sample, 21 (61%) answered correctly, seven (21%) answered incorrectly and six (18%) did not know the correct response option.

For Question 7, "an insulin reaction is characterized by," the correct answer was 1, "shakiness." For Group I, seven (41%) answered correctly, nine (53%) answered incorrectly and one (6%) did not know the correct response option. For Group II, eight (47%) answered correctly, four (24%) answered incorrectly and five (29%) did not know the correct response option. For the total sample, 15 (44%) answered correctly, 13 (37%) answered incorrectly and six (18%) did not know the correct response option.

For Question 8, "if persons with diabetes mellitus stop taking their anti-diabetic medication, their blood sugar will," the correct answer was 2, "increase." For Group I, 15 (88%) answered correctly, two (12%) answered incorrectly and 0 (0%) did not know the correct response option. For Group II, 12 (70%) answered correctly, one (6%) answered incorrectly and four (24%) did not know the correct response

option. For the total sample, 27 (79%) answered correctly, three (9%) answered incorrectly and four (12%) did not know the correct response option.

For Question 9, "if persons with diabetes mellitus should develop intestinal flu and are unable to eat, they should," the correct answer was 3, "take their prescribed anti-diabetic medication and call their physician." For Group I, 14 (82%) answered correctly, two (12%) answered incorrectly and one (6%) did not know the correct response option. For Group II, five (29%) answered correctly, seven (41%) answered incorrectly and five (29%) did not know the correct response option. For the total sample, 19 (55%) answered correctly, nine (27%) answered incorrectly and 18 (6%) did not know the correct response option.

For Question 10, "persons with diabetes mellitus have sugar in their urine because," the correct answer was 1, "they have too much sugar in their blood." For Group I, eight (47%) answered correctly, eight (47%) answered incorrectly and one (6%) did not know the correct response option. For Group II, 10 (58%) answered correctly, two (18%) answered incorrectly and four (24%) did not know the correct response option. For the total sample, 18 (52%) answered correctly, 11 (33%) answered incorrectly and five (15%) did not know the correct response option.

For Question 11, "persons with diabetes mellitus have special diets because," the correct answer was 2, "they require specifically balanced amounts of sugars and carbohydrates, fats and proteins." For Group I, seven (41%) answered correctly, nine (53%) answered incorrectly and one (6%) did not know the correct response option. Group II, nine

(52%) answered correctly, four (24%) answered incorrectly and four (24%) did not know the correct response option. For the total sample, 16 (46%) answered correctly, 13 (39%) answered incorrectly and five (15%) did not know the correct response option.

For Question 12, "which statement is correct," the correct answer was 2, "persons with diabetes mellitus may occasionally have sugar in their urine." For Group I, nine (53%) answered correctly, five (29%) answered incorrectly and three (18%) did not know the correct response option. For Group II, 11 (64%) answered correctly, four (24%) answered incorrectly and two (12%) did not know the correct response option. For the total sample, 20 (58%) answered correctly, nine (27%) answered incorrectly and five (15%) did not know the correct response option.

For Question 13, "if persons with diabetes mellitus are having an insulin reaction, they should," the correct answer was 3, "drink 6-8 ounces of orange juice." For Group I, 12 (70%) answered incorrectly, five (30%) answered incorrectly and 0 (0%) did not know the correct response option. For Group II, 10 (59%) answered correctly, four (24%) answered incorrectly and two (12%) did not know the correct response option. One participant did not select any response option. For the total sample, 22 (65%) answered correctly, nine (27%) answered incorrectly and two (6%) did not know the correct response option and one Group II participant did not select any response option.

For Question 14, "according to the urine testing method you now use," participants answered one of three questions: a, b, or c. For Question 14a, "when testing for sugar in the urine with testape, which

color indicates excessive sugar in the urine," the correct answer was 2, "green." For Group I, there were eight (47%) respondents out of 17. All eight respondents selected response option 2. For Group II, there were eight (47%) respondents out of 17. Five (29%) selected response option 2 and three (18%) selected response option 3. For the total sample, there were 16 respondents out of 34. Thirteen (38%) selected response option 2 and three (9%) selected response option 3. For Question 14b, "when testing for sugar in the urine with strips, which color indicates excessive sugar in the urine," the correct answer was 3, "brown." For Group I, there were three (18%) respondents out of 17. All three respondents selected response option 3. For Group II, there were four (24%) respondents out of 17. One (6%) selected response option 3 and three (18%) selected response option 1. For the total sample, there were seven respondents out of 34. Four (12%) selected response option 3 and three (9%) selected response option 1. For Question 14c, "when testing for sugar in the urine with clinitest tablets, which color indicates excessive sugar in the urine," the correct answer was 2, "brown." For Group I, there were five (30%) respondents out of 17. Three (18%) selected response option 2 and two (12%) selected response option 3. For Group II, there were three (18%) respondents out of 17. Two (12%) selected response option 2 and one (6%) selected response option 3. For the total sample, there were eight respondents out of 34. Five (15%) selected response option 2 and three (9%) selected response option 3. For Question 14, parts a, b, and c, there was a total of

31 respondents. Three participants did not respond to this question as they did not test their urine.

For Question 15, "if urine tests show excessive amounts of sugar in the urine for three consecutive days, persons with diabetes mellitus should," the correct answer was 1, "call their doctor." For Group I, 12 (70%) answered correctly, three (18%) answered incorrectly and two (12%) did not know the correct response option. For Group II, nine (52%) answered correctly, four (24%) answered incorrectly and four (24%) did not know the correct response option. For the total sample, 21 (61%) answered correctly, seven (21%) answered incorrectly and six (18%) did not know the correct response option.

For Question 16, "an exchange diet," the correct answer was 1, "is necessary for most persons with diabetes mellitus to correctly arrange food groups, amounts and calories." For Group I, 11 (64%) answered correctly, two (12%) answered incorrectly and four (24%) did not know the correct response option. For Group II, 10 (58%) answered correctly, three (18%) answered incorrectly and four (24%) did not know the correct response option. For the total sample, 21 (61%) answered correctly, five (15%) answered incorrectly and eight (24%) did not know the correct response option.

Results of analysis of the Knowledge Questionnaire indicated higher knowledge levels by 19 percent in Group II as compared to Group I. Group I averaged 62 percent correct responses, Group II averaged 81 percent correct responses and the total sample averaged 71 percent correct answers.

Compliance Questionnaire

A six-item compliance questionnaire was used to identify frequency of disease-related behaviors for persons with type I or type II adult onset diabetes mellitus (Appendix G). Frequency distributions of the raw data from individual responses for Group I, Group II and the total sample are shown in Appendix L. The participants were asked to circle the response option that most closely related to their individual practices. Questions 1 through 4 had the following response options: "daily," "frequently," "seldom," and "never." Question 5 had "yes" or "no" for the response options. Question 6 had "every 3 months or less," "every year or less," "only when I am sick" and "never." The mean and standard deviation for individual responses of Group I, Group II and the total sample are shown in Table 14.

For Question 1, "I take my anti-diabetic medication," Group I responses were 17 (100%) "daily." For Group II, responses were six (35%) "daily," none (0%) "frequently," one (6%) "seldom," and 10 (59%) "never." The mean and standard deviation were 2.88 and 1.45 respectively. For the total sample, responses were 23 (68%) "daily," none (0%) "frequently," one (3%) "seldom," and 10 (29%) "never." The mean and standard deviation were 1.94 and 1.39 respectively.

For Question 2, "I test my urine for sugar," Group I responses were seven (41%) "daily," five (29%) "frequently," two (12%) "seldom," and three (18%) "never." The mean and standard deviation were 2.056 and 1.14 respectively. For Group II, responses were three (18%) "daily," seven (41%) "frequently," two (12%) "seldom," and five (29%) "never."

Table 14. Results of the Compliance Questionnaire: The Mean and Standard Deviation for Each Item

QUESTION	Group I		Group II		Total	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
1	1.00	0.00	2.88	1.45	1.94	1.39
2	2.06	1.14	2.53	1.13	2.29	1.14
3	1.47	0.87	2.12	0.99	1.79	0.98
4	1.77	0.83	1.88	0.86	1.82	0.83
5	1.24	0.44	1.44	0.63	1.33	0.54
6	1.41	0.71	1.75	0.78	1.58	0.75

The mean and standard deviation were 2.06 and 1.14 respectively. For the total sample, responses were 10 (29%) "daily," 12 (35%) "frequently," four (12%) "seldom," and eight (24%) "never." The mean and standard deviation were 2.29 and 1.14 respectively.

For Question 3, "I check my feet for sores," Group I responses were 12 (71%) "daily," three (18%) "frequently," one (6%) "seldom," and one (6%) "never." The mean and standard deviation were 2.12 and .99 respectively. For Group II, responses were five (29%) "daily," seven (41%) "frequently," three (18%) "seldom," and two (12%) "never." The mean and standard deviation were 1.47 and .87 respectively. For the total sample, responses were 17 (50%) "daily," 12 (29%) "frequently," four (12%) "seldom," and three (9%) "never." The mean and standard deviation were 1.79 and .98 respectively.

For Question 4, "I follow my diabetic diet," Group responses were seven (41%) "daily," eight (47%) "frequently," one (6%) "seldom," and one (6%) "never." The mean and standard deviation were 1.88 and .86 respectively. For Group II, responses were six (35%) "daily," eight (47%) "frequently," two (12%) "seldom," and one (6%) "never." The mean and standard deviation were 1.77 and .83 respectively. For the total sample, responses were 13 (38%) "daily," 16 (47%) "frequently," three (9%) "seldom," and two (6%) "never." The mean and standard deviation were 1.82 and .83 respectively.

For Question 5, "when I feel a diabetic reaction occurring, I take some form of sugar," Group I responses were 13 (76%) "yes" and four (24%) "no." The mean and standard deviation were 1.44 and .63

respectively. Group II responses were 10 (63%) "yes" and six (37%) "no." The mean and standard deviation were 1.24 and .44 respectively. Total group responses were 23 (70%) "yes" and 10 (30%) "no." The mean and standard deviation were 1.33 and .54 respectively.

For Question 6, "I see the doctor for a checkup," Group I responses were 12 (71%) "every 3 months or less," three (18%) "every year or less," two (12%) "only when I am sick," none (0%) "never." The mean and standard deviation were 1.75 and .78 respectively. For Group II, responses were seven(44%) "every 3 months or less," six (38%) "every year or less," three (19%) "only when I am sick," none (0%) "never." The mean and standard deviation were 1.41 and .71 respectively. For the total sample, responses were 19 (58%) "every 3 months or less," nine (27%) "every year or less," five (15%) "only when I am sick," none (0%) "never." The mean and standard deviation were 1.58 and .75 respectively. There was one missing case.

Analysis of Relationships

Pearson Correlation, also known as the Product Moment Coefficient of Correlation, was run across all of the instruments item-by-item. In this study, Pearson's Correlation Coefficient was used to explore the relationships among health care beliefs, knowledge and compliance in the total sample, Group I and Group II. The level of statistical significance was set at $p \leq 0.05$. Table 15 presents the Pearson Product Moment Correlation coefficients for variables in the model and demographic variables for the total sample. This table demonstrates that

Table 15. Pearson's Product Moment Correlation Coefficients for Variables in the Model and Demographic Variables for the Total Sample

	Age	Education	Year Diagnosed	Value	Responsibility	Knowledge
AGE	-	N.S.	N.S.	N.S.	N.S.	-.43
EDUCATION	N.S.	-	N.S.	N.S.	N.S.	N.S.
YEAR DIAGNOSED	N.S.	N.S.	-	N.S.	N.S.	N.S.
VALUE	N.S.	N.S.	N.S.	-	.50	N.S.
RESPONSIBILITY	N.S.	N.S.	N.S.	.50	-	N.S.
KNOWLEDGE	-.43	N.S.	N.S.	N.S.	N.S.	-

$p = \leq .05$

N.S. = Not Significant

the only statistically significant relationships between the model and demographic variables were between value and responsibility and knowledge and age.

In the total sample, significant correlations were observed among the following: value and type of diabetic education ($r=.404$); value and responsibility 1 ($r=.515$), responsibility 2 ($r=.618$), responsibility 4 ($r=.491$), responsibility 7 ($r=.408$), responsibility 8 ($r=.365$), responsibility 13 ($r=.366$); value and compliance 5 ($r=.380$), and compliance 6 ($r=.438$). Significant correlations were observed among responsibility and type of diabetic education ($r=.441$); responsibility and value 2 ($r=.582$), value 5 ($r=.477$), value 6 ($r=.545$), value 7 ($r=.406$); responsibility and knowledge 2 ($r=.370$), knowledge 3 ($r=.402$), knowledge 7 ($r=.425$); responsibility and compliance 5 ($r=.473$). Significant correlations were observed among knowledge and age ($r=.433$), knowledge and incidence of diabetic teaching ($r=.467$); knowledge and type of diabetic education ($r=.691$); knowledge and value 2 ($r=.382$); knowledge and responsibility 2 ($r=.670$), responsibility 4 ($r=.379$), responsibility 7 ($r=.372$). The statistical significance between value and responsibility was $r=.504$.

In Group I, significant correlations were observed among the following: value and income ($r=.497$); value and responsibility 2 ($r=.755$), responsibility 4 ($r=.534$), responsibility 8 ($r=.534$), responsibility 9 ($r=.559$). Statistical significance was observed among responsibility and value 4 ($r=.596$); responsibility and compliance 3 ($r=.546$). Significant correlations were observed among knowledge and level of education ($r=.555$), knowledge and weight ($r=.505$), knowledge

and responsibility 9 ($r=.522$). The correlation between value and responsibility was $r=.652$.

In Group II, significant correlations were observed among the following: value and responsibility 1 ($r=.546$), responsibility 2 ($r=.570$), responsibility 4 ($r=.529$), responsibility 13 ($r=.550$); value and knowledge 14 ($r=.528$) and knowledge 16 ($r=.659$). Significant correlations were observed among responsibility and income ($r=.519$); responsibility and type of diabetic education ($r=.637$); responsibility and value 1 ($r=.518$), value 2 ($r=.675$), value 5 ($r=.716$), value 6 ($r=.671$), value 7 ($r=.508$); responsibility and knowledge 2 ($r=.526$), knowledge 3 ($r=.535$), knowledge 4 ($r=.513$), knowledge 7 ($r=.518$); responsibility and compliance 6 ($r=.626$). Significant correlations were observed among knowledge and age ($r=.669$); knowledge and incidence of diabetic teaching ($r=.575$); knowledge and type of diabetic education ($r=.745$); knowledge and responsibility 2 ($r=.709$), responsibility 4 ($r=.745$), responsibility 7 ($r=.533$). There was no significant correlation between value and responsibility.

To determine differences between the means of Group I and Group II on the Value and Responsibility Questionnaires, t-tests were run (Table 16). Results of the Value Questionnaire showed that Group I had a total scale mean of 28.29 with a standard deviation of 2.64 and Group II had a total scale mean of 26.59 with a standard deviation of 3.842. Results of the Responsibility Questionnaire showed that Group I had a total scale mean of 50.82 with a standard deviation of 4.25 and Group II had a total scale mean of 50.94 with a standard deviation of 5.71.

Table 16. Total Value and Total Responsibility t-tests for Group I and Group II

Variable	No. of Cases	Mean	S.D.	Pooled Variance Estimate				
				T Value	Degrees of Freedom	2-Tail Probability	Significance	
TOTAL VALUE	Group I	17	28.29	2.64	1.51	32	.14	N.S.
	Group II	17	26.59	3.84				
TOTAL RESPONSIBILITY	Group I	17	50.82	4.25	-.07	32	.95	N.S.
	Group II	17	50.94	5.71				

CHAPTER 5

DISCUSSION OF FINDINGS, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

This chapter presents findings in relation to the conceptual framework and the literature review. Also discussed are conclusions, implications and recommendations for future research.

Findings in Relation to the Conceptual Framework and Review of the Literature

The conceptual framework was based on the Health Belief Model (HBM) created by Hochbaum (1958) and later revised by Haefner and Kirscht (1970), Becker (1974), and Rosenstock (1975). The HBM was based on beliefs, attitudes and values and proposed that the avoidance of disease revolved around the following: susceptibility, severity, behaviors reducing susceptibility and/or severity, health gains without psychological barriers. To broaden the applicability of the HBM, Becker (1976) adapted moderator variables to the model that interact with health behavior. Moderator variables were categorized as social-psychological, reference group influence, knowledge of disease and treatment (Devon and Powers 1984). Rosser (1971) contended that in part, one's opinions, beliefs, values and attitudes must be considered in the quest to achieve a desired end.

The purpose of this study was to explore the relationships among health care beliefs, knowledge and compliance in clients with type I or type II adult onset diabetes mellitus. The instruments were designed to elicit possible relationships among the variables. In a study by Given et al. (1983) results indicated that patients with diabetes mellitus did not accept responsibility for their disease and, in fact, evaded their responsibility and passed it on to significant others. Results of the responses to the Value Questionnaire in the present study revealed an average of 88 percent agreement for either "very important" or "somewhat important" for each value. Results of the responses to the Responsibility Questionnaire revealed an average of 51 percent uniformity for the level of agreement for each statement of responsibility. For Responsibilities 1, 2, 3, 4, 6, 8, 9, 10, 11, 12, and 13, there was an average 89 percent response for "strongly agree" or "agree." For Questions 5 and 7, which were reversed on the Responsibility Questionnaire, there was an average 69 percent response to "disagree" or "strongly disagree." Results of the Value and Responsibility Questionnaire indicate strong attitude and response held by the sample population.

Schwartz et al. (1962) conducted a study which was replicated and supported by Neely et al. (1968) with chronically ill, elderly patients and found that a significant cause of medication errors is due to inaccurate knowledge. In a previous study by Curtis (1961), results indicated that only six out of 10 patients who correctly administered their own medications were knowledgeable as to the medication's purpose.

Results of a study by Beggan et al. (1982) related to diabetes mellitus found a knowledge deficiency in patient-related diabetic management. In a study by Paulozzi et al. (1984) effects of an educational program for patients with diabetes mellitus found significant improvement in disease management and control with the implementation of educational programs.

For the Knowledge Questionnaire used for the total sample in this study there was an average of 61 percent correct responses for each question, an average of 25 percent incorrect responses for each question and an average of 15 percent indicating no knowledge. The Knowledge Questionnaire was designed to obtain knowledge of the sample and to ask questions dealing with information deemed basic to the client with type I or type II adult onset diabetes mellitus.

Compliance requires self-regulation in such diseases as diabetes mellitus (Stroebe et al. 1981). Green et al. (1982) conducted a study using the Health Belief Model and found that medication compliance is influenced by patient beliefs, perceptions and disease knowledge.

The Compliance Questionnaire used in this study found that 74 percent of the sample performed compliance behaviors daily or frequently, items 1-4, 70 percent of the sample population took sugar for treatment of a diabetic reaction and 58 percent saw the doctor every three months or less.

Comparison of Type I and Type II

Results of the responses to the Value Questionnaire indicated a total scale mean of 28.29 and a standard deviation of 2.64 in Group I.

For Group II, the total scale mean was 26.59 and the standard deviation was 3.84. Results of the Responsibility Questionnaire indicated a total scale mean of 50.82 and a standard deviation of 4.25 for Group I. For Group II, the total scale mean was 50.94 and the standard deviation was 5.71. Results of the Knowledge Questionnaire indicated a total scale mean of 10.76 and a standard deviation of 3.15 for Group I. For Group II, the total scale mean was 13.76 and the standard deviation was 11.37.

For the Value Questionnaire, Group I demonstrated a higher response to "very important" and "somewhat important." For the Responsibility Questionnaire, Group II had a higher response to "strongly agree" and "agree." For the Knowledge Questionnaire, Group II demonstrated a 19 percent higher number of correct response options than Group I. For the Compliance Questionnaire, 14 (87%) of Group I responded to "daily" or "frequently" to Questions 1-4, whereas 10 (62%) of Group II responded to "daily" or "frequently" for Questions 1-4. In Group II, only six (35%) responded to "daily" for Question 1 because not all Group II participants were prescribed to take oral hyperglycemics. In Group II, 12 (70%) responded to "daily" or "frequently" to Questions 2-4. In Group I, 13 (76%) responded to "yes" for Question 5 whereas, in Group II, 11 (60%) responded to "yes" for Question 5. In Group I, 12 (71%) responded to seeing the physician every three months whereas Group II, seven (44%) responded to seeing the physician every three months.

Conclusions

The purpose of this study was to examine the relationships among health care beliefs, knowledge and compliance. This study also evaluated

health care beliefs and knowledge as related to compliance in clients with type I and type II adult onset diabetes mellitus. From the data presented in the preceding chapters, the following conclusions are drawn:

1. The study's findings indicated a statistically significant relationship between value and responsibility for all subjects.

2. The study's findings did not indicate statistical significance between knowledge and value, knowledge and responsibility or knowledge and compliance.

3. The study's findings did not indicate a statistically significant relationship between Group I and Group II regarding value and responsibility but indicated a trend toward strong attitudes regarding value and responsibility.

4. The study's findings indicated a difference between Group I and Group II in knowledge level and that Group II demonstrated a 19 percent higher number of correct response options.

5. The study's findings indicated difference between Group I and Group II in compliance behaviors and that Group I demonstrated a higher frequency of compliance behaviors.

Implications

The study provides further insight into the disease-related needs of clients with type I and type II diabetes mellitus. Although the total sample exhibited an overall significant response to the meaning of values and responsibilities, overall knowledge and compliance results did not demonstrate adequate knowledge and compliance levels. The

significance of this for nursing is that clients may verbalize all the correct "should" and "ought to" responses and not have adequate understanding of their disease or motivation to follow a prescribed regimen. Nursing is in a key position in the health care industry to closely scrutinize the client's health care beliefs, knowledge and compliance to identify areas of needed improvement and to target acceptable methods of encouragement for the client.

Recommendations

Recommendations for further study include:

1. Conduct a study to compare knowledge levels to compliance in clients with type I and type II adult onset diabetes mellitus.
2. Conduct a study to compare attitudes of clients toward their disease-related regimen and their level of compliance.
3. Conduct the same study using a total sample population all of whom have been diagnosed within a year.
4. Retest the Value and Responsibility Questionnaires to increase Alpha reliability.

Summary

The study findings suggest that although the participants demonstrated strong response supporting the importance of the study's values and responsibilities as related to disease management, the participants did not demonstrate an equally strong response as represented by adequate knowledge and compliance levels. Nurses have a major responsibility in assisting to bridge this gap. Only through intensive screening of clients

to determine their health care beliefs, knowledge level and compliance, can nurses identify areas of misconceptions, erroneous information and inadequate understanding and subsequently advise/teach clients, thereby enhancing disease management.

Beginning with the diagnosis of type I or type II adult onset diabetes mellitus, health care management must include assessment of the client's health care beliefs, knowledge and compliance. Subsequent client contacts must involve reassessment and reevaluation of health care beliefs, knowledge and compliance to maximize optimal client-directed disease management.

APPENDIX A
LETTER OF SUPPORT

I have granted my permission to Christine E. Yelton to conduct her research study at Pima County Home Health and to contact clients who have been or presently are on the active or inactive register of Pima County Home Health. I realize that a chart review will be conducted and that clients will be interviewed in their homes.

Linda Darnell
Administrator's Signature
5-7-85
Date

APPENDIX B
HUMAN SUBJECTS APPROVAL

**THE UNIVERSITY OF ARIZONA**

TUCSON, ARIZONA 85721

COLLEGE OF NURSING

MEMORANDUM

TO: Christine Yelton
Graduate Student
College of Nursing

FROM: Ada Sue Hinshaw, PhD, RN ^{ASH}
Director of Research

Katherine Young, PhD, RN
Chairman, Research Committee

DATE: April 23, 1985

RE: Human Subjects Review: Relationships Among Health Care Beliefs,
Knowledge and Compliance in Clients with Type I or Type II
Adult Onset Diabetes Mellitus

Your project has been reviewed and approved as exempt from University review by the College of Nursing Ethical Review Subcommittee of the Research Committee and the Director of Research. A consent form with subject signature is not required for projects exempt from full University review. Please use only a disclaimer format for subjects to read before giving their oral consent to the research. The Human Subjects Project Approval Form is filed in the office of the Director of Research if you need access to it.

We wish you a valuable and stimulating experience with your research.

ASH/fp

APPENDIX C
DISCLAIMER

DISCLAIMER

Relationships Among Health Care Beliefs,
Knowledge and Compliance in Clients With
Type I or Type II Adult Onset Diabetes Mellitus

You are being asked to participate in a study concerning the relationships among health care beliefs, knowledge and compliance in clients with type I or type II adult onset diabetes mellitus. The investigator also requests your permission to review your patient record at Pima County Home Health. You will be asked to fill out five questionnaires including information regarding personal data, health care beliefs, knowledge of disease and disease-related practices. If you have any questions while completing the questionnaire, the interviewer will be glad to assist you.

Your participation in this study is voluntary and all information gathered will be held in strict confidence. Information gathered from the questionnaires will be presented only as a group response. Your participation in this study will not result in any medical, social or legal risks for you. You will have access to the results of this study and you may withdraw from the study at any time without any ill effects.

Christine E. Yelton
627 South Marvin Street
298-6010

APPENDIX D
VALUE QUESTIONNAIRE

APPENDIX D

VALUE QUESTIONNAIRE

Directions: The following is a list of 8 values which you are asked to respond to according to importance to you. Please circle the answer for each value which corresponds to your answer. Your response options are:

Very Important	4
Somewhat Important	3
Least Important	2
Not Important	1

- | | | | | |
|-----------------------------------|---|---|---|---|
| 1. Adaptability | 4 | 3 | 2 | 1 |
| (ability to accept change) | | | | |
| 2. Comfort | 4 | 3 | 2 | 1 |
| (ease of life) | | | | |
| 3. Body Image | 4 | 3 | 2 | 1 |
| (how you look) | | | | |
| 4. Family Support | 4 | 3 | 2 | 1 |
| (family assistance) | | | | |
| 5. Responsibility | 4 | 3 | 2 | 1 |
| (doing for yourself) | | | | |
| 6. Self-Esteem | 4 | 3 | 2 | 1 |
| (self-respect) | | | | |
| 7. Control | 4 | 3 | 2 | 1 |
| (independent life-management) | | | | |
| 8. Dependence | 4 | 3 | 2 | 1 |
| (allowing others to provide care) | | | | |

APPENDIX E
RESPONSIBILITY QUESTIONNAIRE

APPENDIX E

RESPONSIBILITY QUESTIONNAIRE

Directions: Please read the following statements and circle one answer for each question. Your response options are:

Strongly Agree - SA
 Agree - A
 Undecided - U
 Disagree - D
 Strongly Disagree - SD

- | | | | | | |
|---|----|---|---|---|----|
| 1. Persons with diabetes mellitus should have yearly checkups. | SA | A | U | D | SD |
| 2. Persons with diabetes mellitus should follow the doctor's orders. | SA | A | U | D | SD |
| 3. Persons with diabetes mellitus should take advice from other persons with diabetes mellitus rather than from the doctor. | SA | A | U | D | SD |
| 4. Persons with diabetes mellitus should learn as much as possible about diabetes mellitus. | SA | A | U | D | SD |
| 5. It is the doctor's responsibility to know as much as possible about diabetes mellitus not the patient's responsibility. | SA | A | U | D | SD |
| 6. Persons with diabetes mellitus should independently manage their disease. | SA | A | U | D | SD |
| 7. Families of persons with diabetes mellitus should help the person with diabetes mellitus to manage his/her disease. | SA | A | U | D | SD |
| 8. Persons with diabetes mellitus should follow their diet daily. | SA | A | U | D | SD |
| 9. Persons with diabetes mellitus should test their urine daily. | SA | A | U | D | SD |
| 10. Persons with diabetes mellitus should check their feet for sores daily. | SA | A | U | D | SD |
| 11. Persons with diabetes mellitus should know the signs of hypoglycemia. | SA | A | U | D | SD |
| 12. Persons with diabetes mellitus should know the signs of hyperglycemia. | SA | A | U | D | SD |
| 13. Persons with diabetes mellitus should know the treatment for hypoglycemia. | SA | A | U | D | SD |

APPENDIX F
KNOWLEDGE QUESTIONNAIRE

APPENDIX F

KNOWLEDGE QUESTIONNAIRE

Directions: Please answer the following questions. Circle one answer for each question.

Example:

Diabetes mellitus is a disease of:

1. too little insulin.
2. too much insulin.
3. too little sugar.
4. too much sugar.

1. The body organ that produces insulin is the:
 1. heart.
 2. blood.
 3. pancreas.
 4. I do not know.
2. Insulin causes the blood sugar:
 1. to increase.
 2. to decrease.
 3. has no effect.
 4. I do not know.
3. Which complication are persons with diabetes mellitus likely to have?
 1. Migraines
 2. Cold sores
 3. Blindness
 4. I do not know.
4. Which word describes "low blood sugar?"
 1. Hypoglycemia
 2. Hyperglycemia
 3. Diabetic retinopathy
 4. I do not know.
5. How often does a person with diabetes mellitus test his/her urine?
 1. Only when they exercise
 2. Each time they urinate
 3. Before meals
 4. I do not know.

6. What is the cause of an insulin reaction?
 1. Eating too much sweets
 2. Not enough exercise
 3. Too much insulin
 4. I do not know.

7. A insulin reaction is characterized by:
 1. shakiness.
 2. too much sugar.
 3. thirst.
 4. I do not know.

8. If persons with diabetes mellitus stop taking their anti-diabetic medication, their blood sugar will:
 1. not be affected.
 2. increase.
 3. decrease.
 4. I do not know.

9. If persons with diabetes mellitus develop intestinal flu and are unable to eat, they should:
 1. not take their anti-diabetic medication.
 2. reduce their anti-diabetic medication by 1/2.
 3. take their prescribed anti-diabetic medication and contact their physician.
 4. I do not know.

10. Persons with diabetes mellitus have sugar in their urine because:
 1. they have too much sugar in their blood.
 2. they have kidneys which do not function correctly.
 3. they do not drink enough water.
 4. I do not know.

11. Persons with diabetes mellitus have special diets because:
 1. they are always overweight.
 2. they require specifically balanced amounts of sugars and carbohydrates, fats and proteins.
 3. they are never allowed to eat sugars or carbohydrates.
 4. I do not know.

12. Which statement is correct?
 1. Persons with diabetes mellitus can never have snacks.
 2. Persons with diabetes mellitus may occasionally have sugar in their urine.
 3. Persons with diabetes mellitus have to watch only calories.
 4. I do not know.

13. If persons with diabetes mellitus are having an insulin reaction, they should:
1. call the doctor.
 2. lie down immediately as it will naturally pass.
 3. drink 6-8 ounces of orange juice.
 4. I do not know.
14. According to the urine testing method you now use, answer one of the following three questions.
- a. When testing for sugar in the urine with testape, which color indicates excessive sugar in the urine?
1. Yellow
 2. Green
 3. Blue
 4. I do not know.
- b. When testing for sugar in the urine with strips, which color indicates excessive sugar in the urine?
1. Blue
 2. Orange
 3. Brown
 4. I do not know.
- c. When testing for sugar in the urine with clinitest tablets, which color indicates excessive sugar in the urine?
1. Blue
 2. Brown
 3. Green
 4. I do not know.
15. If urine tests show excessive amounts of sugar in the urine for three consecutive days, persons with diabetes mellitus should:
1. call their doctor.
 2. increase their anti-diabetic medication.
 3. eat only 1/2 the usual amount of food.
 4. I do not know.
16. An exchange diet:
1. is necessary for most persons with diabetes mellitus to correctly arrange food groups, amounts and calories.
 2. is not necessary for persons with diabetes mellitus as insulin takes care of all their needs.
 3. takes the place of insulin.
 4. I do not know.

APPENDIX G
COMPLIANCE QUESTIONNAIRE

APPENDIX G

COMPLIANCE QUESTIONNAIRE

Directions: Please answer all of the questions. Circle your answer.

1. I take my anti-diabetic medication:
 1. daily.
 2. frequently.
 3. seldom.
 4. never.

2. I test my urine for sugar:
 1. daily.
 2. frequently.
 3. seldom.
 4. never.

3. I check my feet for sores:
 1. daily.
 2. frequently.
 3. seldom.
 4. never.

4. I follow my diabetic diet:
 1. daily.
 2. frequently.
 3. seldom.
 4. never.

5. When I feel a diabetic reaction occurring, I take some form of sugar.
 1. Yes
 2. No

6. I see the doctor for a checkup:
 1. every 3 months or less.
 2. every year or less.
 3. only when I am sick.
 4. never.

APPENDIX H
DATA INFORMATION SHEET

APPENDIX H
DATA INFORMATION SHEET

Directions: Please check or fill in the correct answer.

1. Age: _____
2. Sex:
Male _____
Female _____
3. Do you take insulin?
Yes _____
No _____
4. Ethnicity:
White _____
Black _____
Hispanic _____
Other _____
5. Highest grade of school completed:
1-6 _____
7-8 _____
9-12 _____
College _____
6. Year diagnosed with adult onset diabetes mellitus: _____
7. Average annual income:
Less than \$5000 _____
More than \$5000 _____
8. Weight: _____
9. Height: _____
10. Have you received any teaching about diabetes mellitus?
Yes _____
No _____
If you answered number 10 "yes," please answer questions 11 and 12.
11. When did you receive teaching about diabetes mellitus?

12. What type of teaching did you receive?
Verbal instruction: _____
Written instruction: _____

APPENDIX I
MEN'S AND WOMEN'S WEIGHTS
ACCORDING TO FRAME SIZE

MEN'S AND WOMEN'S WEIGHTS ACCORDING TO FRAME SIZE

Height		Small	Medium	Large
Ft	In	Frame	Frame	Frame
Men				
5	2	128-134	131-141	138-150
5	3	130-136	133-143	140-153
5	4	132-138	135-145	142-156
5	5	134-140	137-148	144-160
5	6	136-142	139-151	146-164
5	7	138-145	142-154	149-168
5	8	140-148	145-157	152-172
5	9	142-151	148-160	155-176
5	10	144-154	151-163	158-180
5	11	146-157	154-166	161-184
6	0	149-160	157-170	164-188
6	1	152-164	160-174	168-192
6	2	155-168	164-178	172-197
6	3	158-172	167-182	176-202
6	4	162-176	171-187	181-207
Women				
4	10	102-111	109-121	118-131
4	11	103-113	111-123	120-134
5	0	104-115	113-126	122-137
5	1	106-118	115-129	125-140
5	2	108-121	118-132	128-143
5	3	111-124	121-135	131-147
5	4	114-127	124-138	134-151
5	5	117-130	127-141	137-155
5	6	120-133	130-144	140-158
5	7	123-136	133-147	143-163
5	8	126-139	138-150	146-167
5	9	129-142	139-153	149-170
5	10	132-145	142-156	152-173
5	11	135-148	145-159	156-176
6	0	138-151	148-162	158-179

Walser, M., A.L. Imbembo, S. Margolis, G.A. Elfert (1984). Nutritional Management. Philadelphia: W.B. Saunders Company, p. 384.

APPENDIX J
FREQUENCY DISTRIBUTION OF INDIVIDUAL
RESPONSES FOR VALUE QUESTIONNAIRE

FREQUENCY DISTRIBUTION OF INDIVIDUAL RESPONSES FOR VALUE QUESTIONNAIRE

	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Value 1 (N=34)			
VI	13 (76)	10 (59)	23 (68)
SI	3 (18)	6 (35)	9 (26)
LI	1 (6)	1 (6)	2 (6)
NI	0 (0)	0 (0)	0 (0)
Total	17 (100)	17 (100)	34 (100)
Value 2 (N=34)			
VI	14 (82)	9 (53)	23 (68)
SI	2 (12)	7 (41)	9 (26)
LI	1 (6)	1 (6)	2 (6)
NI	0 (0)	0 (0)	0 (0)
Total	17 (100)	17 (100)	34 (100)
Value 3 (N=34)			
VI	8 (47)	4 (24)	12 (35)
SI	7 (41)	8 (46)	15 (44)
LI	1 (6)	2 (12)	2 (9)
NI	1 (6)	3 (18)	4 (12)
Total	17 (100)	17 (100)	34 (100)
Value 4 (N=34)			
VI	11 (64)	9 (52)	20 (58)
SI	4 (24)	3 (18)	7 (21)
LI	1 (6)	2 (12)	3 (9)
NI	1 (6)	3 (18)	4 (12)
Total	17 (100)	17 (100)	34 (100)
Value 5 (N=34)			
VI	13 (76)	12 (71)	25 (74)
SI	4 (24)	5 (29)	9 (26)
LI	0 (0)	0 (0)	0 (0)
NI	0 (0)	0 (0)	0 (0)
Total	17 (100)	17 (100)	34 (100)

Appendix J, Continued

	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Value 6 (N=34)			
VI	12 (71)	13 (76)	25 (74)
SI	5 (29)	4 (24)	9 (26)
LI	0 (0)	0 (0)	0 (0)
NI	0 (0)	0 (0)	0 (0)
Total	17 (100)	17 (100)	34 (100)
Value 7 (N=34)			
VI	15 (88)	12 (70)	27 (79)
SI	2 (12)	3 (18)	5 (15)
LI	0 (0)	1 (6)	1 (3)
NI	0 (0)	1 (6)	1 (3)
Total	17 (100)	17 (100)	34 (100)
Value 8 (N=34)			
VI	3 (18)	4 (24)	7 (21)
SI	7 (41)	6 (35)	13 (38)
LI	6 (35)	6 (35)	12 (35)
NI	1 (6)	1 (6)	2 (6)
Total	17 (100)	17 (100)	34 (100)

Response Range: 1 (low) and 4 (high)

APPENDIX K
FREQUENCY DISTRIBUTION OF INDIVIDUAL
RESPONSES FOR RESPONSIBILITY QUESTIONNAIRE

FREQUENCY DISTRIBUTION OF INDIVIDUAL RESPONSES FOR
RESPONSIBILITY QUESTIONNAIRE

	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Responsibility 1 (N=34)			
SA	13 (76)	11 (65)	24 (71)
A	4 (24)	6 (35)	10 (29)
U	0 (0)	0 (0)	0 (0)
D	0 (0)	0 (0)	0 (0)
SD	0 (0)	0 (0)	0 (0)
Total	17 (100)	17 (100)	34 (100)
Responsibility 2 (N=34)			
SA	15 (88)	13 (76)	28 (82)
A	2 (12)	3 (18)	5 (15)
U	0 (0)	0 (0)	0 (0)
D	0 (0)	1 (6)	1 (3)
SD	0 (0)	0 (0)	0 (0)
Total	17 (100)	17 (100)	34 (100)
Responsibility 3 (N=34)			
SA	7 (41)	7 (41)	14 (41)
A	6 (35)	5 (29)	11 (32)
U	1 (6)	2 (12)	3 (9)
D	1 (6)	2 (12)	3 (9)
SD	2 (12)	1 (6)	3 (9)
Total	17 (100)	17 (100)	34 (100)
Responsibility 4 (N=34)			
SA	8 (47)	9 (53)	17 (50)
A	8 (47)	7 (41)	15 (44)
U	1 (6)	1 (6)	2 (6)
D	0 (0)	0 (0)	0 (0)
SD	0 (0)	0 (0)	0 (0)
Total	17 (100)	17 (100)	34 (100)

Appendix K, Continued

	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Responsibility 5 (N=34)			
SA	4 (24)	1 (6)	1 (3)
A	4 (24)	3 (18)	7 (21)
U	3 (18)	2 (12)	5 (15)
D	4 (24)	6 (35)	10 (20)
SD	6 (34)	5 (29)	11 (32)
Total	17 (100)	17 (100)	34 (100)
Responsibility 6 (N=34)			
SA	6 (35)	4 (24)	10 (29)
A	5 (29)	5 (29)	10 (29)
U	3 (18)	5 (29)	8 (24)
D	3 (18)	3 (18)	6 (18)
SD	0 (0)	0 (0)	0 (0)
Total	17 (100)	17 (100)	34 (100)
Responsibility 7 (N=34)			
SA	0 (0)	0 (0)	0 (0)
A	1 (6)	1 (6)	2 (6)
U	2 (12)	4 (24)	6 (18)
D	8 (47)	10 (58)	18 (52)
SD	6 (35)	2 (12)	8 (24)
Total	17 (100)	17 (100)	34 (100)
Responsibility 8 (N=34)			
SA	8 (47)	9 (53)	17 (50)
A	8 (47)	5 (29)	13 (38)
U	1 (6)	3 (18)	4 (12)
D	0 (0)	0 (0)	0 (0)
SD	0 (0)	0 (0)	0 (0)
Total	17 (100)	17 (100)	34 (100)

Appendix K, Continued

	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Responsibility 9 (N=34)			
SA	7 (41)	5 (29)	12 (35)
A	6 (35)	6 (35)	12 (35)
U	4 (24)	3 (18)	7 (21)
D	0 (0)	2 (12)	2 (6)
SD	0 (0)	1 (6)	1 (3)
Total	17 (100)	17 (100)	34 (100)
Responsibility 10 (N=34)			
SA	7 (41)	6 (35)	13 (38)
A	9 (53)	9 (53)	18 (53)
U	1 (6)	2 (12)	3 (9)
D	0 (0)	0 (0)	0 (0)
SD	0 (0)	0 (0)	0 (0)
Total	17 (100)	17 (100)	34 (100)
Responsibility 11 (N=34)			
SA	4 (24)	10 (58)	14 (42)
A	8 (47)	3 (18)	11 (32)
U	5 (29)	4 (24)	9 (26)
D	0 (0)	0 (0)	0 (0)
SD	0 (0)	0 (0)	0 (0)
Total	17 (100)	17 (100)	34 (100)
Responsibility 12 (N=34)			
SA	4 (24)	7 (41)	11 (32)
A	9 (52)	6 (35)	15 (44)
U	4 (24)	4 (24)	8 (24)
D	0 (0)	0 (0)	0 (0)
SD	0 (0)	0 (0)	0 (0)
Total	17 (100)	17 (100)	34 (100)

Appendix K, Continued

	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Responsibility 13 (N=34)			
SA	5 (29)	10 (59)	15 (45)
A	7 (42)	2 (12)	9 (26)
U	5 (29)	5 (29)	10 (29)
D	0 (0)	0 (0)	0 (0)
SD	0 (0)	0 (0)	0 (0)
Total	17 (100)	17 (100)	34 (100)

APPENDIX L
FREQUENCY DISTRIBUTION OF INDIVIDUAL
RESPONSES FOR COMPLIANCE QUESTIONNAIRE

FREQUENCY DISTRIBUTION OF INDIVIDUAL RESPONSES FOR
COMPLIANCE QUESTIONNAIRE

	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Question 1 (N=34)			
1	17 (100)	6 (35)	23 (68)
2	0 (0)	0 (0)	0 (0)
3	0 (0)	1 (6)	1 (3)
4	0 (0)	10 (59)	10 (29)
Total	17 (100)	17 (100)	34 (100)
Question 2 (N=34)			
1	7 (41)	3 (18)	10 (29)
2	5 (29)	7 (41)	12 (35)
3	2 (12)	2 (12)	4 (12)
4	3 (18)	5 (29)	8 (24)
Total	17 (100)	17 (100)	34 (100)
Question 3 (N=34)			
1	12 (70)	5 (29)	17 (50)
2	3 (18)	7 (41)	10 (29)
3	1 (6)	3 (18)	4 (12)
4	1 (6)	2 (12)	3 (9)
Total	17 (100)	17 (100)	34 (100)
Question 4 (N=34)			
1	7 (41)	6 (35)	13 (38)
2	8 (47)	8 (47)	16 (47)
3	1 (6)	2 (12)	3 (9)
4	1 (6)	1 (6)	2 (6)
Total	17 (100)	17 (100)	34 (100)

Appendix L, Continued

	Group I (Number/Percent)	Group II (Number/Percent)	Total (Number/Percent)
Question 5 (N=33)			
1	13 (76)	10 (63)	23 (70)
2	4 (24)	6 (37)	10 (30)
3	0 (0)	0 (0)	0 (0)
4	0 (0)	0 (0)	0 (0)
Total	17 (100)	16 (100)	33 (100)
Question 6 (N=33)			
1	12 (70)	7 (43)	19 (58)
2	3 (18)	6 (38)	9 (27)
3	2 (12)	3 (19)	5 (15)
4	0 (0)	0 (0)	0 (0)
Total	17 (100)	16 (100)	33 (100)

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